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GRADE CROSSING CONTRAVENTIONS AND MOTOR CARRIER SAFETY ASSESSMENT

Prepared for
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by
L-P Tardif & Associates Inc.

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16. Abstract

This project is part of a larger R&D initiative launched by Transport Canada under Direction 2006. Under this federal initiative, launched in 1996, Transport Canada has an objective of reducing grade crossing occurrences and trespassing occurrences by 50 percent by 2006.

This report investigates infractions and occurrences at public grade crossings involving commercial vehicles as defined by the National Safety Code (i.e., vehicles over 4,500 kg). It provides a summary of existing statistical evidence on occurrences at grade crossings involving commercial vehicles and a description of the grade crossing infractions included under provincial highway traffic acts and regulations.

The report describes the procedures used by the provinces and territories to assess the safety performances of motor carriers and provides a description of the infractions included under the motor carrier and driver profiles. It also investigates the situation in the United States and identifies the level of awareness on the part of regulators and motor carriers regarding the issue of grade crossing contraventions and occurrences.

Based on the findings of the research, the report makes recommendations to enhance safety at grade crossings and national uniformity of treatment of the contraventions taking place at grade crossings.

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16. Résumé

Ce projet fait partie d'un vaste programme de R&D mis sur pied par Transports Canada dans le cadre de Direction 2006. Cette initiative fédérale, lancée par Transports Canada en 1996, vise à réduire de moitié les accidents qui surviennent aux passages à niveau et les cas d'intrusion sur les propriétés ferroviaires d'ici 2006.

Ce rapport porte sur les infractions et les accidents aux passages à niveau publics mettant en cause des véhicules commerciaux tels que définis par le Code national de sécurité (véhicules de plus de 4 500 kg). Il propose un résumé des données statistiques sur les accidents impliquant des véhicules commerciaux aux passages à niveau, ainsi qu'un inventaire des infractions aux passages à niveau prévues par les lois, règlements et codes de la route provinciaux.

Il discute des méthodes utilisées par les provinces et les territoires pour évaluer le rendement des transporteurs routiers sur le plan de la sécurité, et énumère les infractions prises en compte dans les profils des conducteurs et des transporteurs. Il examine en outre la situation aux États-Unis et mesure le degré de sensibilisation des organismes de réglementation et des transporteurs routiers à l'égard des infractions et des accidents aux passages à niveau.

S'appuyant sur les résultats de l'étude, les chercheurs formulent des recommandations pour améliorer la sécurité aux passages à niveau et pour rendre plus uniforme le traitement des infractions aux passages à niveau.

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This study is a part of the Highway-Railway Grade Crossing Research Program, an undertaking sponsored by Transport Canada, major Canadian railways, and several provincial authorities. The program is a component of Direction 2006, a cooperative initiative with the goal of halving grade crossing accidents by 2006.

EXECUTIVE SUMMARY

This research project is one of the projects supported by Rail Safety and the Transportation Development Centre under their R&D mandates and Direction 2006. It purports to address road safety-related behaviour and is especially aimed at commercial operators. This project goes beyond the traditional 3-E (Engineering - Education - Enforcement) approach traditionally used for grade crossing safety improvements. In a sense it could be classified as a "hybrid E", as it fits between Education and Enforcement.

This project deals with infractions and occurrences at public grade crossings involving commercial vehicles as defined by the National Safety Code (i.e., vehicles over 4,500 kg). This includes vehicle types ranging from cube vans delivering courier or consumer goods to tractor semi-trailers. It also includes passenger buses with a capacity to transport 10 passengers or more (including the driver). Commercial drivers are those drivers holding a Class 1, 2, 3, 4 or 5 licence as defined under the National Safety Code (NSC). It is understood that some provinces have variations on those standards.

The objectives of this project were as follows:

- Provide a summary of existing statistical evidence on occurrences at grade crossings involving commercial vehicles;
- Provide a description of the grade crossing infractions included under provincial highway traffic acts and regulations;
- Provide a description of the infractions included under the motor carrier and driver profiles;
- Provide a brief description on the situation in the United States;
- Identify the level of awareness on the part of regulators and motor carriers regarding this issue;
- Make recommendations to enhance safety and national uniformity of treatment.

A literature search conducted as part of this project did not identify any research on the relationship between grade crossing occurrences and motor carrier safety ratings. Nor did there seem to be any research on the treatment being given to such infractions as part of the assessment of the safety performance of motor carriers.

The statistical review performed as part of this project can be summarized as follows:

- In 2000, commercial vehicles were involved in 12.6 percent of the occurrences at public crossings across Canada for a total of 33 occurrences. This represented an increase over 1999, in which 25 occurrences were recorded. This represented, then, 8.8 percent of all occurrences at public crossings.
- Generally speaking, this number of occurrences is small when considered in the context of total involvement by commercial vehicles in all road accidents (less than 1 percent).
- The number of fatalities and serious injuries is also small when considered in the same context (i.e., 3 in 2000 and 1 in 1999).

- Grade crossing contraventions in Ontario represent a small percentage (0.02 percent) of the total number of contraventions in that province. Other provinces likely have similar experience, but no statistics could be obtained at this stage.
- 2000 marked an increase in the number of occurrences involving commercial vehicles at public grade crossings. Before that year, there had been a reduction in occurrences involving commercial vehicles at public grade crossings.
- Statistics, as currently gathered by the Transportation Safety Board of Canada, do not allow specific analysis of the occurrences in terms of characteristics of the commercial fleets and drivers involved.

The project looked at the legislative and regulatory framework and found that the framework exists for proper recognition of grade crossing contraventions at both the federal and provincial/territorial levels. Furthermore, with the implementation of NSC standard #14 in all provinces and territories, and with the amendments to the Motor Vehicle Transport Act, there will soon be a mechanism for treating those contraventions.

Motor carrier safety performance ratings are based on motor carrier violations with respect to reportable accidents, convictions, Commercial Vehicle Safety Alliance inspections, and results of facility audits. Procedures have also been developed to establish threshold levels for each category of motor carrier according to fleet size.

Reportable occurrences at grade crossings are included in the motor carrier safety rating. The definition of *reportable accident* may, however, vary from province to province and the number of demerit points assessed to an accident may also vary between provincial regimes.

The following table provides a list of grade crossing contraventions for which a ticket is issued or for which there has been a conviction, and the associated demerit points assessed to motor carriers and commercial drivers. The table includes only provinces with a motor carrier safety rating system in place and where grade crossings exist.

Demerit Points Assessed to Motor Carriers for Grade Crossing Contraventions

	Demerit Points by Province(s)			
Contraventions	**NB**	**QC**	**ON**	**Prairie Provinces***
Failing to stop before a grade crossing when indicated or hazardous	3			3
Driving vehicle through or around barrier at grade crossing	3		3	
Failing to stop at stop sign at grade crossing	3			
Failing to stop at grade crossing		3		
Failing to stop at grade crossing when transporting explosives, flammable materials, or paying passengers	3			
Changing gears while crossing railway tracks at grade crossing	3			
Changing gears while crossing railway tracks at grade crossing – school and passenger bus			5	
Crossing railway tracks at grade crossing using a gear that needs to be changed – school and passenger bus			5	
Crossing railway tracks improperly at grade crossing	3			
Failing to look both ways at grade crossing – school and passenger bus			5	
Failing to stop at grade crossing – school and passenger bus			5	
Failing to open door at grade crossing – school and passenger bus			5	
Failing to stop a commercial vehicle at least five metres from railway tracks at grade crossing		3	3	
Engaging a vehicle on railway tracks at grade crossing without allowing enough space for that vehicle		3		
Performing a U-turn on/near grade crossing			2	
Stopping in the wrong place at grade crossing – school and passenger bus			5	
Stopping in the wrong place at portable signal at grade crossing			2	3

***Prairie Provinces have agreed to use the CCMTA Conviction Equivalency Table.**

A review of violations/contraventions by province revealed the following:

- Grade crossing violations are one of the many types of violations included in the safety assessment of each provincial regime.
- There is wide variation of grade crossing violations among the provincial regimes.
- Although the number of demerit points assessed to grade crossing violations (which, in fact, reflects a certain degree of severity in terms of violations) varies among provincial regimes, the seriousness of these types of violations seems to be recognized by the highest points assessed.
- Grade crossing violations were probably not a priority when provinces were deciding on the assessment to be given to these infractions.

Uniformity of treatment for contraventions at grade crossings was also investigated and two perspectives on the aspect of uniformity were highlighted.

- Inclusion of contraventions at grade crossings: This issue lacks focus. There is a wide divergence in terms of what provinces include in the list of contraventions to assess motor carriers' safety performance.
- Severity of treatment: The severity of treatment given to grade crossing contraventions varies by province. While the wording of the offence could differ by jurisdiction, the same contraventions should receive the same treatment across Canada.

The following question was also asked: Should occurrences involving a commercial vehicle at a grade crossing be treated differently than other occurrences? The case for treating it differently can probably be made on the basis of either the "logistical chain reaction" it can create or the risk of multiple fatalities in the case of an occurrence involving passengers or dangerous goods. It is very unlikely, however, that the safety assessment in itself would prevent such a tragedy from taking place.

This research revealed the existence of a Conviction Equivalency Table developed by the Canadian Council of Motor Transport Administrators (CCMTA) in 1997. The need for uniform treatment and severity of treatment for contraventions has long been recognized by the CCMTA. The CCMTA table is currently used in the three Prairie Provinces and, to a certain extent, all provincial/territorial jurisdictions have used it in establishing their safety assessment regimes. However, provinces like New Brunswick, Ontario and Quebec have chosen not to use the Conviction Equivalency Table at this stage.

The CCMTA Conviction Equivalency Table contains only two grade crossing violations. For both violations, the treatment recommended is three demerit points: the maximum number of points for violations other than Criminal Code violations.

The research also examined the recording of contraventions in driver profiles. It should be noted that Canada has had a uniform driver's licence for many years and the question of multiple licences being used by commercial drivers does not exist. Furthermore, all provincial and territorial jurisdictions have established a system of demerit points. These points are part of a driver's profile or abstract.

Violations to highway traffic regulations pertaining to grade crossings are treated the same as any other infraction. The violation is noted on the driver's profile and demerit points are assessed. This is, of course, in addition to the points assessed to the motor carrier for which that driver was working at the time.

Points assessed in a driver's profile can also lead to sanctions such as the suspension of a driver's licence. A contravention at a grade crossing would not disqualify a commercial driver unless that driver had accumulated enough points prior to pleading guilty to this new contravention. This nuance is significant since a long period of time may elapse between a court decision on a contravention and the day that infraction took place.

The link between driver profiles and motor carrier profiles exists in an implicit way. It is up to any motor carrier to verify its drivers' abstracts or driver profiles. While it is possible to make the link between the driver's profile and the motor carrier's profile more explicit, this would not seem to serve any specific purpose or resolve any major issues at this time.

In the United States, the emphasis for actions regarding grade crossing contraventions is on drivers. Grade crossing violations are not tied to U.S. Department of Transportation motor carrier safety ratings. The arduous task of data transfer from states, railroad companies and municipalities is raised as an obstacle for pursuing this issue.

The project concluded that the issue of grade crossing contraventions and occurrences has not received much attention during the debates across Canada on motor carrier safety assessment and rating. With so few occurrences involving commercial vehicles at grade crossings, the statistics tend to support those who favour a status quo. Furthermore, over the past several years, there has been a reduction in occurrences involving commercial vehicles at public grade crossings.

The project recommends different actions to all parties interested in this issue. These actions are aimed at improving safety at grade crossings:

- Better characterization of commercial vehicle operators involved in grade crossing contraventions and occurrences to identify the "offenders";
- Clear description of the types of contraventions at grade crossings to be included in motor carriers' safety assessment;
- Uniform treatment of demerit points given for contraventions;
- Clear description of commercial driver crossing contraventions including type and definition;
- Wider diffusion of Operation Lifesaver material to reach as many commercial vehicle operators as possible. The use of place mats at truck stops is one action that can reach many commercial vehicle operators.

The project confirmed that all parties take grade crossing occurrences as a serious safety concern and all are willing to cooperate to improve transportation safety in general.

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GLOSSARY

CDL:	Commercial Driver's License
CCMTA:	Canadian Council of Motor Transport Administrators
CVSA:	Commercial Vehicle Safety Alliance
FHWA:	Federal Highway Administration
FMCSA:	Federal Motor Carrier Safety Administration
FRA:	Federal Railway Administration
MVTA:	Motor Vehicle Transport Act
NSC:	National Safety Code
PIC:	Partners in Compliance
TDC:	Transportation Development Centre
TSB:	Transportation Safety Board of Canada
U.S. DOT:	United States Department of Transportation

1. INTRODUCTION

Canada has a total of 22,898 public grade crossings where 262 road vehicle-train occurrences took place in 2000. These resulted in 32 fatalities. Commercial vehicles were involved in 33 occurrences at public crossings in 2000 and, as a result of these occurrences, there were two fatalities and nine serious injuries. In an effort to reduce the number of collisions and their consequences, Transport Canada launched a collaborative effort called Direction 2006. The objective of this federal initiative, launched in 1996, is to reduce grade crossing and trespassing occurrences by 50 percent by 2006. As part of this initiative, Transport Canada's Rail Safety Directorate tasked the Transportation Development Centre (TDC) to develop and manage an R&D program designed to support the objectives of Direction 2006.

This research project is one of the projects supported by Rail Safety and TDC under their R&D mandates. It purports to address road safety-related behaviour and is especially aimed at commercial operators. This project goes beyond the traditional 3-E (Engineering - Education - Enforcement) approach traditionally used for grade crossing safety improvements. In a sense it would be classified as a "hybrid E", as it fits between Education and Enforcement.

It has long been recognized that an accident involving a heavy vehicle and a train may have far greater consequences than an accident involving a car and a train. In the United States, one of the most notorious occurrences was on October 25, 1995, when a commuter train crashed into a school bus in Fox River Grove, Illinois, killing seven children. A heavy vehicle-train collision can have potentially significant human, environmental and logistical repercussions, especially when the heavy vehicle and/or train is transporting dangerous goods or when passengers are involved.

Under proposed federal and provincial rules, motor carrier safety performances will be assessed and provincial governments will issue safety fitness certificates. This is often referred to the motor carrier safety rating process, which will take into consideration safety violations and infractions committed by commercial motor carriers and drivers. Infractions at grade crossings, among others, have long been part of provincial traffic regulations and therefore would be considered in motor carrier safety assessment.

This report specifically addresses the treatment of infractions and occurrences involving commercial vehicles at grade crossings under this new safety assessment and rating process. It examines whether that treatment is uniform throughout Canada and outlines the U.S. approach to this issue.

The report also discusses the manner in which commercial operators and insurance companies treat these infractions, and the mechanisms they may have to prevent these incidents and occurrences from happening. Finally, recommendations are presented for possible enhancement of safety at grade crossings through the recognition of grade crossing infractions in the safety assessment of motor carriers.

2. PROJECT SCOPE AND OBJECTIVES

This project examined infractions and occurrences at public grade crossings involving commercial vehicles as defined by the National Safety Code (i.e., vehicles over 4,500 kg). This includes vehicle types ranging from cube vans delivering courier or consumer goods to tractor semi-trailers. It also includes passenger buses with a capacity to transport 10 passengers or more (including the driver). Commercial drivers are those drivers holding a Class 1, 2, 3, 4 and 5 licence as defined under the National Safety Code (NSC). It is understood that some provinces have variations on those standards.

The objectives of this project are as follows:

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- Provide a brief description on the situation in the United States;
- Identify the level of awareness on the part of regulators and motor carriers regarding this issue;
- Make recommendations to enhance safety and national uniformity of treatment.

It was noted that the definition of an "event" at a grade crossing varies by level of government. Provincial road authorities often use the term "accident" or "collision" to describe an event involving a vehicle where the vehicle may have been disabled or a person may have been injured or killed. In the United States these events would be defined as a "crash". In the case of accidents taking place at a railway grade crossing, the Transportation Safety Board of Canada (TSB) would describe these events as an "occurrence".

The same situation exists for the use of the term "contravention". Provincial jurisdictions tend to use the terms "violations" and "convictions" for infractions committed under the highway traffic act and regulations rather than "contravention". At the federal level, the existence of the Contraventions Act has defined violations and infractions as contraventions.

For the purpose of this report, the terms "occurrence" and "contravention" will be used.

Information gathering for this project was conducted through a literature review and telephone interviews of government and motor carrier organization representatives.

3. LITERATURE REVIEW

Much of the literature pertaining to safety at grade crossings relates to the engineering aspect of grade crossings and, more recently, to the deployment of Intelligent Transportation Systems.[1] Research in the United States has often been motivated by high-profile occurrences involving school buses and the deployment of high speed rail systems in some heavily populated areas.

In Canada, research on grade crossings has focused on the engineering aspects of grade crossing (crossbuck design and ITS deployment) and on enforcement issues (mandatory stop at grade crossings for heavy vehicles transporting dangerous goods).

In the United States, research on grade crossing safety has been aided by two major initiatives. The first was the U.S. Department of Transportation (DOT) Rail-Highway Crossing Safety Action Plan released by the Secretary of Transportation in 1994. In that Plan, the U.S. DOT established a goal to reduce occurrences and fatalities by 50 percent within 10 years. The Plan also contains six specific initiatives, including increased enforcement and increased public education, as well as a research component.

The second major initiative was a Task Force established by the Secretary of Transportation following the 1995 Fox River Grove accident in which seven students died in a school bus-train accident. The Task Force directed its efforts to problem areas outside the scope of the 1994 Action Plan.

This Task Force produced a report entitled *Accidents That Shouldn't* Happen,[2] in which five grade crossing areas were identified for detailed examination: interconnected signals, vehicle storage space, high-profile crossings, light rail transit, and special vehicle operations. The last area – special vehicle operations – is probably the closest the Task Force came to dealing specifically with commercial vehicles and, in particular, heavy vehicles.

The report recognized that the responsibility for public grade crossings resides with state and local governments, railroads, and transit agencies. The recommendations dealt with driver licensing but more from the view of testing new applicants.

Neither of these major initiatives focused on the behavioural aspect of drivers at grade crossings nor did either deal specifically with motor carrier issues.

The literature search also identified one specific study covering behavioural research related to grade crossing occurrences. This study, conducted in the United States in 1998, indicated that between 10 and 20 percent of the motoring population is likely to engage in risky behaviour around railway grade crossings. These results came from a survey of 891 randomly selected residents in Michigan.[1]

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[1] A. Polk Gribbon, *ITS Applications to Railroad Crossing Safety: A Summary of U.S. Activities*, Jet Propulsion Lab/Maden Tech Inc, 1998.

[2] U.S. Department of Transportation, *Accidents That Shouldn't Happen*, report of the Grade Crossing Task Force to Secretary Frederico Pena, 1996.

It was striking that nearly 14 percent of the people interviewed stated that even if a train were in sight, they would proceed around the gates even with the warning lights flashing. Approximately 10 percent of the sample indicated they found it exciting to try and beat the train. These "risk seekers", as they are called in the paper, were more likely to be male and to have had personal frustrating experiences at grade crossings. The study recommended that communication campaigns target the specialized group of drivers that routinely try to beat the train – the risk seekers. It also recommended that communication campaigns address the frustrations of previous experiences.

The study did not, however, indicate whether the drivers in the sample were commercial drivers. This leads to an interesting observation about the need to identify the "risk seekers" among all drivers, and particularly commercial drivers, so that preventive programs can be applied.

With respect to the identification of so-called "risk seekers", but this time at a corporate level, some studies have been performed in the United States regarding the potential link between the financial and safety performance of motor carriers.[2] These studies showed that the pattern of accident rates is highest at the less profitable end of the scale. Under a motor carrier safety assessment and rating regime, these motor carriers would be rated as unsatisfactory and sanctions would follow. None of the analysis, however, was done with particular emphasis on grade crossing occurrences.

Furthermore, given the difficulty of conducting these studies in light of the type of information they require, they could not be duplicated in Canada, which unlike the United States, does not have a uniform classification of accounts that would allow such in-depth studies to be performed. In Canada, motor carrier expenses are classified according to good accounting principles and each motor carrier enters its expenses using its own code system.

The literature search did not identify any research on the relationship between grade crossing occurrences and motor carrier safety ratings. Nor did there seem to be any research on the treatment being given to such infractions as part of the assessment of the safety performance of motor carriers. One study in Canada was conducted on the more general theme of uniformity for motor carrier profiles and ratings. That study focused on rating systems in general and the topic of grade crossings was not addressed.[3]

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[1] K. Witte and W. Donohue, "Preventing Vehicle Crashes with Trains at Grade Crossings: The Risk Seeker Challenge", *Accident Analysis and Prevention*, 32, pp.127-138, 2000.

[2] United States General Accounting Office, Freight Trucking, *Promising Approach for Predicting Carrier's Safety Risks*, 1991.

[3] F. Nix, National Safety Code Standard # 14 – *Description and Analysis of Procedures, Road Safety and Motor Vehicle Regulations*, Transport Canada, 2000.

4. STATISTICAL REVIEW

Table 1 summarizes commercial vehicle involvement in occurrences at grade crossings.

Table 1 - Annual Grade Crossing Occurrences for Federally Regulated Railways

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Total	386	407	386	379	390	380	366	307	273	282	262
Commercial Vehicles Involved	54	53	35	55	47	65	53	49	33	49	46
Commercial Vehicles as % of Total	13.9	13.0	9.0	14.5	12.0	17.1	14.4	15.9	12.0	17.3	17.5

Source: Transport Canada, Occurrence Data Analysis and Reports

The data show that commercial vehicles represent a relatively significant proportion of occurrences at grade crossings, almost constantly over the 10 percent threshold. This 10 percent threshold is significant as it represents more than the approximate estimate of the proportion of commercial vehicles on the road; usually 5% of the total number of registered vehicles.[1] However, without exposure-level data it is impossible to speculate whether commercial vehicles are over-represented or under-represented in occurrences at grade crossings.

This report focuses solely on occurrences at public grade crossings in keeping with the objectives of the project. These crossings include both automatic and passive crossings. The occurrences take place on public highways and can easily be related to the safety assessment of motor carriers. Data for farm and private grade crossings may not be complete, especially where the occurrences involve only property damage.

Table 2 shows the types of vehicles involved by type of crossing. It notes that if occurrences at private and farm grade crossings are taken out, the number of occurrences involving commercial vehicles totals 33 in 2000. Over the five-year period between 1996 and 2000, there has been an average of 28 occurrences at public grade crossings. According to TSB, 88 percent of tractor trailers involved in grade crossing occurrences are struck by trains, compared to 67 percent for cars and 71 percent for straight trucks. There are few occurrences involving passenger buses or highway and rail vehicles transporting dangerous goods.

The data also show that injuries and/or fatalities vary greatly over the years. Fatalities have declined significantly and in 2000 there were only two fatalities as a result of occurrences between a commercial vehicle and a train.

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[1] Transport Canada, *Transportation in Canada 1999*, Annual Report., p. 158

Table 2 - Commercial Vehicle Involvement in Occurrences at Grade Crossings

Vehicle Type	Crossing Type	Year										
		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Bus	Automatic	0	0	1	0	1	0	0	0	0	0	0
	Passive	1	1	0	0	2	0	0	0	0	0	0
Dangerous Goods Involved*	Automatic	0	0	0	1	2	0	0	0	0	0	0
	Passive	0	1	1	0	0	0	1	0	2	0	0
Straight Truck	Farm	0	0	0	0	0	1	1	0	1	0	0
	Private	4	1	3	10	8	11	11	8	6	7	4
	Automatic	10	7	4	9	5	16	5	5	7	5	6
	Passive	14	10	6	16	12	21	14	16	7	7	4
Tractor Trailer	Farm	0	0	0	0	0	0	0	0	0	1	0
	Private	2	4	3	6	5	6	6	11	4	16	9
	Automatic	11	17	13	6	7	4	9	6	4	6	10
	Passive	12	12	4	6	5	6	6	3	2	7	13
Total		54	53	35	55	47	65	53	49	33	49	46
Public Crossing Only		48	47	28	37	32	47	34	30	20	25	33
Fatalities & Serious Injuries		5 0	6 0	9 2	6 11	7 2	2 6	1 9	1 6	3 0	1 9	3 3

* "Dangerous Goods Involved" means that dangerous goods were present and were transported by either a commercial vehicle or railway cars.

Source: Transport Canada, Occurrence Data Analysis and Reports

Table 2 shows that, excluding occurrences at private and farm grade crossings, the number of occurrences involving commercial vehicles increased to 33 in 2000 or 12.6 percent of the grand total for that year. In 1999 the percentage was 8.8 percent. The number of fatalities and serious injuries remained within the range of previous years. This represents a small percentage of total occurrences involving commercial vehicles. Although the involvement rate of 12.6 percent is superior to the involvement rate of commercial vehicles in total road occurrences, it still falls within the traditional area of around 10 percent.[1]

In 1999 the average number of occurrences for commercial vehicles at public crossings had declined by just over 30 percent compared to the average of the previous seven years. This reduction was in line with the objective of Direction 2006, which is to reduce grade crossing occurrences by 50 percent by 2006. The increase in 2000 in the number of occurrences involving commercial vehicles probably means that some special efforts may have to be devoted to that sector.

Table 3 shows the geographic distribution of these occurrences over a five-year period. British Columbia and Alberta have a much greater number of occurrences involving commercial vehicles as compared to their relative number of public grade crossings. Newfoundland's data is a sole occurrence that involved a commercial vehicle hitting a grade crossing post belonging to a national railway company, even though the rail tracks had been removed some time ago.

Table 3 - Geographical Distribution of Occurrences at Public Grade Crossings

Province (number of public crossings in brackets – total 22,898)	**% of Occurrences Involving Commercial Vehicles (1993-1998)**	**% of National Total**
British Columbia (1,085)	15%	4.7%
Alberta (3,762)	21%	16.4%
Saskatchewan (6,450)	13%	28.1%
Manitoba (3,047)	10%	13.3%
Ontario (5,481)	25%	23.9%
Quebec (2,577)	12%	11.2%
New Brunswick (325)	2%	1.4%
Nova Scotia (164)	1%	0.7%
Newfoundland (7)	1%	0.03%

Source: Transportation Safety Board

It is noted that the statistics in Table 3 cover only federally regulated railroads. Although some short line railways voluntarily report occurrences at grade crossings, most railways under provincial jurisdiction are not covered by TSB statistics. This could leave a small number of occurrences out of the statistical profile.

The Ministry of Transportation of Ontario provided the total number of contraventions at grade crossings in that province for the period from May 1999 to May 2000. Table 4 lists the contraventions by type and date of occurrence.

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[1] Transport Canada, *Transportation in Canada 1999*, Annual Report, p. 21.

Table 4 - Grade Crossing Contraventions – Ontario (May 1999 to May 2000)

Contravention Type	Date
Fail to stop at railway crossing	2000-04-07
Fail to stop at railway crossing	2000-03-28
Fail to stop at railway crossing	2000-01-28
Fail to stop at railway crossing	2000-01-11
Fail to stop at railway crossing	1999-11-25
Fail to stop at railway crossing	1999-07-04
Crossing railway barrier	1999-06-27
Fail to open door at railway crossing- public vehicle	1999-06-17
Fail to open door at railway crossing- school bus	1999-06-04
Fail to open door at railway crossing- school bus	1999-06-04
Fail to stop at railway crossing- school bus	1999-05-17

Source: Ministry of Transportation of Ontario

A total of 11 grade crossing contraventions were recorded during that period of time out of a total of 53,222 contraventions for all motor carrier profiles. Thus, grade crossing contraventions represent 0.02 percent of all contraventions in Ontario. At this stage, it is not possible to determine whether other provinces with public grade crossings experience the same level of contraventions. It is also not possible to estimate the total number of contraventions that actually occurred and therefore what the effective rate of detection is.

TSB statistics indicate that 25 percent of all grade crossing occurrences involving commercial vehicles take place in Ontario, or approximately seven per year over a five-year period. Thus, the number of recorded contraventions is higher than the number of occurrences.

Although many significant improvements have been made to the statistics on occurrences at grade crossings, the data do not cover items such as the type of motor carrier operation, the type of driver involved, etc. As a result, it is not possible to do such in-depth analysis as involvement by type of tractor-trailer, driver experience, etc. Such factors could be critical to the proper identification of the operators and individuals at greatest risk as an aid in developing appropriately targeted prevention programs.

In summary, the statistical review provided the following:

- In 2000, commercial vehicles were involved in 12.6 percent of the occurrences at public crossings across Canada for a total of 33 occurrences.
- This represents a small number of occurrences when considered in the context of total involvement by commercial vehicles in all road accidents (less than 1 percent).
- The number of fatalities and serious injuries is also small when considered in the same context.
- Grade crossing contraventions in Ontario represent a small percentage (0.02 percent) of the total number of contraventions in that Province. Other provinces likely have similar experience.

- 2000 marked an increase in the number of occurrences involving commercial vehicles. Before that year, there had been a reduction in occurrences involving commercial vehicles at public grade crossings over the preceding three years.
- Statistics, as currently gathered by TSB, do not allow specific analysis of the occurrences in terms of characteristics of the commercial fleets and drivers involved.

It is also noted that train crews collect information on near collisions. For instance, in 2000 Canadian National Railway Police alone recorded a total of 155 near collisions at their grade crossings. Unfortunately these data are not collected on a regular basis and could not be classified as scientific or reliable. Although interesting, these near-collision statistics do not add any valuable additional information for now. Similar data is gathered in the field of air safety but with much greater levels of detail and precision.

5. EXISTING HIGHWAY LAWS AND REGULATIONS

Contraventions and occurrences at grade crossings exist within a larger framework contained in laws and regulations. Because grade crossings involve safety in both the rail and road modes, references on this issue were found at both the federal and provincial/territorial levels.

This section provides details on federal and provincial/territorial laws and regulations covering the highway mode and in some cases, how it deals specifically with grade crossings. It also provides the regulatory background for the inclusion of grade crossing contraventions in motor carrier safety assessment.

On the rail side, the *Railway Safety Act* deals with grade crossing in the following manner: Section 26.2 of the *Railway Safety Act* stipulates that "the users of a road shall give way to railway equipment at a road crossing if adequate warning of its approach is given." This recognition of the right of way is also acknowledged in provincial regulations.

5.1 Federal Laws and Regulations, and Safety Assessment

The Government of Canada has the constitutional responsibility for regulating motor carriers (truck and bus) that operate interprovincially and internationally. The *Motor Vehicle Transport Act, 1987* (MVTA) in turn delegates this authority to the provinces and territories. New amendments to the MVTA were introduced in the House of Commons on March 2, 2000, but did not complete the legislative process prior to the election call. These amendments dealt specifically with motor carrier safety regimes. Similar amendments were introduced in the Senate on January 30, 2001 (Bill S-3).

The amendments to the MVTA will create a national framework for a provincially and territorially run regulatory system focused on the safety performance of motor carriers. This safety performance regime will be based on the NSC for motor carriers.

The NSC contains comprehensive standards addressing commercial vehicle operations. NSC standards are developed through committees made up of federal, provincial, territorial, industry and public interest representatives that report to government through the Canadian Council of Motor Transport Administrators (CCMTA). Provincial and territorial governments voluntarily implement these standards into laws and regulations.

The amendments to the MVTA will allow provinces and territories, whose safety compliance regimes are compatible with NSC standards, to give an extra-provincial carrier a safety rating and to issue to that carrier a safety fitness certificate, all under the authority of the Act. The safety fitness certificate will be recognized by other Canadian jurisdictions.

The amendments will also allow a province or territory, under the authority of the Act, to apply sanctions to extra-provincial motor carriers for poor safety performance, including downgrading their ratings and revoking their safety fitness certificates, and thus their right to operate.

The federal government also regulates other aspects of road safety, such as hours of service for commercial drivers, motor carrier operators, and for the transportation of dangerous goods by road. Extra-provincial motor carriers are also regulated by *Canada Labour Code* standards, which deal more with occupational health and safety rather than road safety.

5.2 Federal Contraventions Act

The *Contraventions Act* was adopted in 1992. The purpose of the Act is to establish a simplified procedure for prosecuting federal offences by ticketing instead of complex court proceedings under *Criminal Code* procedures. With this Act and the signing of administrative agreements between the provinces and the federal government, it is now possible to consider federal offences as contraventions enforceable by provincial/territorial enforcement officers. Even some municipalities, such as Ottawa and Mississauga, have signed agreements with the federal government to cover municipal parking infractions at international airports.

The Contraventions Regulations, made pursuant to section 8 of the Act, lists offences that have to be approved by the Governor in Council to become contraventions. This process is ongoing.

This new system, once fully implemented, will replace and improve the effectiveness of current enforcement procedures that are out of date and insufficient to properly control motor vehicle infractions and trespassers at grade crossings. Offences under the MVTA and the Commercial Vehicle Drivers Hours of Service Regulations are covered by these new procedures.

5.3 Provincial/Territorial Laws and Regulations

Provincial traffic laws and regulations literally cover all vehicles operated on public highways. As we have seen in Section 5.1, with the delegation of powers from the federal government to provincial and territorial administrations, this means that all commercial vehicles, operated by either an extra-provincial undertaking or an intra-provincial undertaking, would fall under provincial/territorial authority.

In that context, provincial/territorial laws and regulations have long included specific sections dealing with grade crossing contraventions. Typically the language used for regulating grade crossing is as follows:

1- General rules

1-1 When a driver is approaching a railway crossing *(a) where a "stop" or "arrêt" sign has been erected at the crossing, he shall stop the vehicle*

(i) not less than 5 metres from the nearest rail of the railway if the crossing is in a restricted speed area, and

(ii) not less than 15 metres from the nearest rail of the railway if the crossing is not in a restricted speed area,

and he shall not proceed unless he can do so in safety;

(b) when a clearly visible electrical or mechanical traffic control device gives warning of the approach of a railway train, he shall stop the vehicle as required by clause (a) and he shall not proceed while any such signal continues to give warning, unless a peace officer or flagman otherwise directs and he can do so in safety; but where the railway crossing is in a restricted speed area and the train is stopped or not in close proximity to the crossing, the driver may proceed to cross the railway crossing if he can do so in safety;

(c) when a crossing gate is lowered or a flagman is giving a signal of approach or passage of a railway train, or a railway train is in dangerous proximity to the crossing and is giving an audible signal or is visible, he shall stop the vehicle as required by clause (a) and he shall not proceed while the gate is lowered or the flagman continues to give warning of approach of a railway train, unless a peace officer or a flagman otherwise directs and he can do so in safety.

1-2 In this section "flagman" includes a brakeman or other trainman on a train of a railway who, in connection with the operation of a train, is warning people on a highway.

2- Stops by certain vehicles at railways

2-1 Except as provided in subsections (3) and (4), the driver of

(a) a vehicle carrying passengers for compensation; or
(b) a school bus carrying children; or
(c) a vehicle carrying flammable liquids or gas, whether or not it is empty;

approaching a railway crossing shall stop the vehicle not less than 5 metres, or more than 15 metres, from the nearest rail of the railway, and, with the vehicle stopped, shall

(d) look in both directions along the railway for an approaching train;
(e) listen for signals indicating the approach of a train; and
(f) in the case of a bus or school bus, open the door of the vehicle;

and he shall not proceed unless he can do so in safety.

2-2 Except as provided in subsection (4), where a driver has stopped and is proceeding as required in subsection (1), he shall cross the railway track in a gear that he will not need to change while crossing the track, and he shall not shift gears while crossing.

2-3 Subsection (1) does not apply where

(a) a peace officer or a flagman directs traffic to proceed; or
(b) the crossing is protected by gates or a railway crossing signal light which are not in operation at the time.

2-4 Subsections (1) and (2) do not apply to

(a) street railway grade crossing within a restricted speed area; or
(b) industrial spur railway crossings within a restricted speed area.

3- Driving through railway barrier

3-1 No person shall drive a vehicle through, around, or under a crossing gate or barrier at a railway crossing while the gate or barrier is closed or is being opened or closed.

4- Penalty

4-1 Any person who violates, contravenes, or disobeys or refuses, omits, neglects, or fails to observe, obey, or comply with

(a) any provision of this Act or of the regulations; or
(b) any municipal by-law duly passed under the authority of this Act; or
(c) any order of a peace officer, a traffic authority, the traffic board, the transport board, or other authority or person, lawfully given by him or it under this Act, or indicated or conveyed by a traffic control device;

is guilty of an offence and, unless another penalty is prescribed therefor herein or in any such by-law or regulation, is liable, on summary conviction, to a fine of not more than $500 and to suspension of licence for a term of not more than 30 days.

The above example is taken from the Manitoba *Highway Traffic Act*; however, it could have been taken from just about any provincial highway traffic act. One notable difference is the requirement in the province of Quebec for commercial vehicles transporting placardable quantities of dangerous goods to come to a full stop at all grade crossings. This specific regulation is identical to U.S. regulations that have been in place for several years.

The above example provides the background for defining the types of contraventions one would expect to find under a motor carrier safety assessment regime.

Appendix A provides full details for all relevant provincial regulations for driver governance at grade crossings.

5.4 National Safety Code

In 1986 the federal government and the provinces and territories agreed to a National Safety Code. The Code contains 16 standards covering everything from hours of work, load security, driver licensing and roadside inspection standards to the process for establishing a safety fitness rating. The NSC is not a regulatory document. It provides uniform guidelines to federal and provincial regulators for the development of road safety regulations.

Standard #14 is entitled Compliance Review – Safety Rating. It establishes the motor carrier safety rating framework in which each jurisdiction shall assess the safety performance of motor carriers and rate them.

The implementation of NSC Standard #14 by each province and territory is still an on-going process. By the end of 2000, the following provinces and territories had a motor carrier safety assessment and motor carrier rating systems substantially in place: Newfoundland, New Brunswick, Quebec, Ontario, Manitoba, Saskatchewan, Alberta and the Northwest Territories. In some cases the regulations in place may have some deviations from NSC Standard #14. At least, and for the benefit of this project, these jurisdictions have established an assessment of motor carrier safety performance. It should also be noted that other provinces and territories are in the process of either developing new regulations or amending existing regulations to meet NSC Standard #14.

As mentioned in Section 5.1 of this report, Transport Canada is in the process of providing the regulatory framework to provinces when dealing with extra-provincial motor carrier safety rating.

In summary, the legislative and regulatory framework exists for proper recognition of grade crossing contraventions at both the federal and provincial/territorial levels. Furthermore, with the implementation of NSC Standard #14 in all provinces and territories, and with the amendments to the MVTA, there will soon be a mechanism for treating those contraventions. Section 6 explains how these mechanisms work and covers specifically how grade crossing contraventions are treated under motor carrier safety assessment regimes.

6. MOTOR CARRIER AND COMMERCIAL DRIVER PROFILES

As stated in Section 5.4, many provinces have a process in place to assess and rate the safety performance of motor carriers. This section explains how this assessment process works and how contraventions and occurrences involving commercial vehicles at grade crossings are included in these processes.

The information gathered for this section of the report is from published documentation and interviews with provincial government officials. The assistance and cooperation of these officials was outstanding and provided considerable guidance in understanding a fairly complex issue.

6.1 Motor Carrier Safety Rating – Description

A motor carrier safety rating is a designation issued by provincial registrars to operators of commercial motor vehicles. These operators may be single entities known as owner-operators or large corporations operating large fleets of commercial vehicles. Ratings are assigned by each province to operators based in its province and, for some like Ontario, to all operators using its highways, regardless of whether these are based in its province. These ratings publicly identify the safety performance of commercial motor vehicle operators.

The objectives of safety ratings are to improve the safety of commercial vehicle operations, encourage the economic competitiveness of safe Canadian motor carriers, and encourage motor carrier safety education and continuous improvement.

Most provincial registrars issue one of four ratings as follows:
- Satisfactory
- Satisfactory-Unaudited
- Conditional
- Unsatisfactory

The exception is Ontario, where there are five possible ratings:
- Excellent
- Satisfactory
- Satisfactory-Unaudited
- Conditional
- Unsatisfactory

Alberta has a special recognition program, known as the Partners In Compliance (PIC) Program. Although PIC and Ontario's five-level rating system use different criteria, the end purpose is to recognize the "best" motor carrier operators from a safety point of view.

A carrier's safety rating is assigned based on information contained in that carrier's safety record. These records accumulate information on the following:

- Accidents – The motor carrier's vehicle is either disabled or injuries and/or fatalities were involved. As stated in Section 2, for the purposes of this project these will be referred to as occurrences.
- Convictions – This is a finding of guilt on charges by a court of law.
- Vehicle Inspections – This is a mechanical inspection performed on the road by a government authority under Commercial Vehicle Safety Alliance (CVSA) rules and guidelines. The CVSA inspection procedure is a North American standard.
- Interventions – This is action taken by a provincial/territorial government, such as warning letters, an interview or a facility audit.
- Sanctions – This may result in fleet limitation, plate seizure, or suspension or cancellation of a carrier's operating privileges.
- Facility Audits – This is a structured review of a motor carrier's books and records on the motor carrier's premises. It may also include the mechanical inspection of vehicles.

The facility audit is an important component of the rating programs. The audit complements the on-highway safety enforcement. During a facility audit, ministry personnel, or third-party representatives in some provinces, examine carrier records and documents related to the various NSC components. A carrier that is rated *Conditional* because of a failed audit score must pass another audit. Using Ontario as an example, a score of less than 55 percent on either the driver or vehicle component of the facility audit constitutes a failure. A score of greater than 80 percent on both the driver and vehicle components results in an *Excellent* rating.

To understand the ratings given to motor carriers, the example of Ontario is used to review what each category means. In Ontario, a motor carrier would normally be eligible for an ***Excellent*** safety rating if the following criteria were met:

- at least 24 months of demonstrated operation in Ontario,
- an overall violation rate of 10 percent or less of overall threshold,
- an accident violation rate of 10 percent or less of the accident threshold, and
- an audit score of 80 percent or better on both the driver and vehicle profiles.

A motor carrier would normally be eligible for a ***Satisfactory*** safety rating if the following criteria were met:

- at least six months of demonstrated operation in Ontario,
- an on-road performance level of 65 percent or less of its overall threshold, and
- an audit score of 55 percent or better on both the driver and vehicle profiles.

A motor carrier that has not been audited would normally receive a ***Satisfactory-Unaudited*** safety rating provided it maintained an on-road performance level of 65 percent or less of its overall threshold. It is possible that a motor carrier may remain in this category indefinitely.

A motor carrier may be considered for a ***Conditional*** safety rating if any of the following circumstances occur:

- an on-road performance level of more than 65 percent of its overall threshold,
- an audit score of lower than 55 percent in each of the driver and vehicle profiles, or
- the expiry of a suspension or plate seizure.

A motor carrier may be considered for an ***Unsatisfactory*** safety rating when its safety performance has deteriorated to such a degree that the motor carrier represents an unreasonable safety risk.

Motor carrier safety performance ratings are based on motor carrier violations with respect to reportable accidents, convictions, CVSA inspections and facility audit results.

- **Reportable Accidents:** Accidents with a minimum of $1000 in property damage and/or involving personal injury are assigned points based on the severity of the accident as indicated in Tables 5 to 7. Occurrences involving commercial vehicles at grade crossings would fall in this category.

  In some jurisdictions, accidents for which no improprieties or vehicle defects are noted on a police report still appear on the motor carrier file but do not incur points.

Table 5 - Demerit Points for Accidents Weighting Factor – Ontario

Severity	No Impropriety	One or more impropriety No Charges	One or more impropriety and Charges
Property Damage	0	2 points	4 points
Personal Injury	0	4 points	8 points
Fatal Injury	0	6 points	12 points

Source: Ontario Ministry of Transportation – *Carrier Safety Rating and Commercial Vehicle Operator's Registration System Public Guidelines*, 2000, p. 20.

Table 6 - Demerit Points for Accidents Weighting Factor – Quebec

Severity	No Impropriety	One or more impropriety and Charges
Property Damage	0	2 points
Personal Injury	0	4 points
Fatal Injury	0	10 points

Source: Société de l'assurance automobile du Québec, *Politique d'évaluation des propriétaires et exploitants de véhicules lourds*, 2000, p. 16.

Table 7 - Demerit Points for Accidents Weighting Factor – Manitoba

Severity	No Impropriety	At Fault Accidents
Property Damage	0	2 points
Personal Injury	0	4 points
Fatal Injury	0	6 points

Source: Manitoba Highways and Government Services, *Safety Ratings*, 2000.

- **Convictions:** Convictions resulting from charges are recorded on a motor carrier's file with point values based on safety severity. Grade crossing contraventions would fall under this category.

- **Inspections:** Mechanical inspections conducted according to CVSA standards are included. An inspection showing that the vehicle has failed the inspection represents one point and an out-of-service infraction incurs three points.

Motor carrier safety performances are based on three separate safety indicators:

- Accident points per vehicle per month;
- Safety-related conviction points per vehicle per month;
- Points on vehicle inspections per vehicle unit inspected.

Accidents are usually given double the weight of convictions and inspections in determining an operator's overall safety performance.

Reviews conducted by provincial personnel demonstrated a need to consider fleet size. Consequently, procedures were developed to establish threshold levels for each category of motor carrier according to fleet size. The percentage of threshold in each category was then combined in a weighted average to arrive at an overall percentage of thresholds. This average was determined using accident rates and safety-related conviction rates for each carrier and comparing them among carriers of varying sizes. The result is a standard by province that identifies unacceptable levels of performance by fleet size. Again, using Ontario as an example, Appendix B illustrates how thresholds are taken into account. Safety rating thresholds also take into account the percentage of travel within a province and the utilization of the vehicles. Thresholds for a given adjusted fleet size are calculated within a sliding two-year window. It should be noted that there are differences in threshold calculation and intervention levels among the provinces.

When a motor carrier reaches an unacceptable violation rate, the following disciplinary interventions and sanctions are triggered:

- Intervention Level 1: Warning Letter
  A warning letter is sent when a motor carrier violation rate exceeds 35 percent of its overall threshold.

- Intervention Level 2: Facility Audit
  An audit is triggered when a motor carrier's violation rate exceeds 65 percent of its overall threshold.

- Intervention Level 3: Interview
  An interview with the motor carrier may be triggered when a carrier's violation rate exceeds 80 percent of its threshold.

- Intervention Level 4: Sanctions
  When a motor carrier reaches 100 percent of its threshold, it could lead to the following sanctions:
  - restriction on the number of commercial vehicles the motor carrier may operate;
  - seizure of plates;
  - suspension of the motor carrier's operating privileges;
  - cancellation of the motor carrier's operating privileges.

For most provinces, the rating assessment given by a province to a motor carrier is available through the Internet. The information provided to the general public does not include details of the assessment, only the final outcome. Ratings can be seen on web sites such as Ontario http://www.carriersafetyrating.com and Quebec http://www.ctq.gouv.qc.ca. It is common belief that making this information available to the public in this fashion will increase the pressure on carriers to improve their rating, especially if shippers take this information into consideration when selecting motor carriers.

6.2 Contraventions Related to Grade Crossings and Severity of Treatment

In all cases, reportable accidents at grade crossings are included in the motor carrier safety rating. The definition of "reportable accident" may, however, vary from province to province and the number of demerit points assessed to an accident may vary between provincial regimes. Some provinces, Manitoba for example, only include accidents in which the commercial vehicle is at fault. Other provinces, like Quebec, include the accident in the company's file but do not assess demerit points in cases where the commercial vehicle is not at fault. Ontario goes one step further and assesses demerit points when improper behaviour or conduct is noted.

Traffic act violations are taken into account when assessing the safety performance of motor carriers. Violations at grade crossings are included in all provincial traffic acts and regulations. Consequently, they are taken into account in the safety assessment of motor carriers.

Table 8 provides a list of grade crossing contraventions for which a ticket is issued or for which there has been a conviction, and the associated demerit points assessed to motor carriers and commercial drivers. The table includes only provinces with a motor carrier safety rating system in place and where grade crossings exist.

Table 8 - Demerit Points Assessed to Motor Carriers for Grade Crossing Contraventions

Demerit Points by Province(s)

Contraventions	NB	QC	ON	Prairie Provinces*
Failing to stop before a grade crossing when indicated or hazardous	3			3
Driving vehicle through or around barrier at grade crossing	3		3	
Failing to stop at stop sign at grade crossing	3			
Failing to stop at grade crossing		3		
Failing to stop at grade crossing when transporting explosives, flammable materials, or paying passengers	3			
Changing gears while crossing railway tracks at grade crossing	3			
Changing gears while crossing railway tracks at grade crossing – school and passenger bus			5	
Crossing railway tracks at grade crossing using a gear that needs to be changed – school and passenger bus			5	
Crossing railway tracks improperly at grade crossing	3			
Failing to look both ways at grade crossing – school and passenger bus			5	
Failing to stop at grade crossing – school and passenger bus			5	
Failing to open door at grade crossing – school and passenger bus			5	
Failing to stop a commercial vehicle at least five metres from railway tracks at grade crossing		3	3	
Engaging a vehicle on railway tracks at grade crossing without allowing enough space for that vehicle		3		
Performing a U-turn on/near grade crossing			2	
Stopping in the wrong place at grade crossing – school and passenger bus			5	
Stopping in the wrong place at portable signal at grade crossing			2	3

*Prairie Provinces have agreed to use the CCMTA Conviction Equivalency Table.

This listing of contraventions by province shows Ontario including a total of 10 grade crossing contraventions as part of its safety assessment of motor carriers. Six out of these ten violations are assessed five demerit points, making that province one of the most severe in assessing demerit points. With the exception of Criminal Code violations, which are assessed between 10 and 30 demerit points, violations are assessed between zero and six demerit points. Therefore, grade crossing contraventions other than Criminal Code contraventions are assessed quite severely in Ontario.

For its part, New Brunswick lists six grade crossing violations for which demerit points are assessed. As in Ontario, Criminal Code violations are assessed the highest number of demerit points in New Brunswick. Other violations are assessed in New Brunswick between one and six demerit points. Therefore, three demerit points is neither severe nor light in terms of assessment.

Quebec and the Prairie Provinces only include two contraventions in their motor carrier assessments. In the case of Quebec, the highest assessment for violations – five demerit points – goes to Criminal Code violations. Most other violations are assessed between one and three points. Only one violation is assessed four points and it relates to overweight. Although Quebec does not include many grade crossing violations in its list of violations being assessed for the safety performance of motor carriers, at least the ones listed are assessed a fairly high ranking.

Interestingly, the Province of Quebec does not include as one of its contraventions the failure of commercial vehicles transporting placardable quantities of dangerous goods to stop at a grade crossing. This issue has raised a lot of attention for the past 10 years in Canada. Although it is required in the U.S., Quebec is the only province to mandate a full stop at grade crossing for all dangerous goods. New Brunswick has such a requirement for explosives and flammable liquids.

The Prairie Provinces have adopted the CCMTA Conviction Equivalency Table (see Section 6.4) under which Criminal Code violations are again given the highest ranking with five demerit points and other violations are assessed between one and three demerit points. Therefore, the two grade crossing violations are assessed the highest ranking in terms of severity. As in Quebec, the Prairie Provinces do not recognize in their contraventions the mandatory stop at grade crossings for motor carriers transporting certain classes of dangerous goods such as flammable liquids.

In summary, the review of violations/contraventions by province revealed the following:

- Grade crossing violations are one of the many types of violations included in the safety assessment of each provincial regime.
- There is wide variation of grade crossing violations among the provincial regimes.
- Although the number of demerit points assessed to grade crossing violations (which, in fact, reflects a certain degree of severity in terms of violations) varies among provincial regimes, the seriousness of these types of violations seems to be recognized by these high points assessed.
- Grade crossing violations were probably not a priority when provinces were deciding on the assessment to be given to these infractions.

6.3 Uniformity of Treatment for Contraventions and Occurrences

Uniformity of treatment for contraventions and occurrences at grade crossings can be seen in two perspectives: inclusion of violations and uniformity in the treatment of violations and occurrences.

- Inclusion of grade crossing contraventions

As seen in Table 8, it is clear that the issue of grade crossing contraventions lacks focus. There is a wide divergence in terms of what provinces include in the list of contraventions to assess motor carrier safety performance. This has repercussions since the exclusion of grade crossing contraventions means that not all actions at grade crossings are accounted for in the motor carrier rating. The recording of contraventions may assist in identifying individuals and operators who represent a greater risk of being involved in an occurrence at grade crossings. This may be particularly relevant in the case of motor carriers transporting passengers or dangerous goods.

- Severity of treatment
  - ➢ Grade crossing contraventions

The severity of treatment given to grade crossing contraventions varies by province. While the wording of the offence could differ by jurisdiction, the same contraventions should receive the same treatment across Canada. Changing gears while crossing a railway crossing may serve to illustrate this point. In New Brunswick, such a contravention is given three demerit points while in Ontario, for school and passenger buses only, the same contravention is given five demerit points. Other provinces do not include this on the list of contraventions. Failure to stop at a grade crossing when transporting dangerous goods is another example.

Perhaps some effort should be devoted to establishing a national list of contraventions for which the severity of punishment is uniform across Canada.

➢ Grade crossing occurrences

It is emphasized that occurrences at grade crossings are accounted for in all existing safety assessment regimes of all provincial jurisdictions. As described in Section 6.1, occurrences fall under three categories: occurrences with property damage, occurrences with injury, and occurrences with fatality. Points are assigned to a motor carrier's profile for an "at fault" occurrence according to the severity of the occurrence (Tables 5 to 7).

Although the degree of severity given to occurrences differs from province to province, the principle is nevertheless the same for all provinces with safety regimes in place.

Of course, this begs the question: Should occurrences involving a commercial vehicle at a grade crossing be treated differently than other occurrences? The case for treating it differently can probably be made on the basis of either the "logistical chain reaction" it can create or the risk of multiple fatalities in the case of an occurrence involving passengers or dangerous goods. Only one occurrence involving many lives either on a train or road vehicle or within a community would suffice to trigger reactions demanding that the motor carrier involved be given the worst possible rating leading to the removal of its operating authority. It is very unlikely, however, that the safety assessment in itself would prevent such a tragedy from taking place.

None of the provincial jurisdictions contacted had given any thought to treating occurrences at grade crossings any differently than any other occurrences. In their view, these occurrences fall under the same category as the others. This reaction is probably to be expected in view of the low ratio of contraventions to occurrences at grade crossings which, looking specifically at Ontario, is less than two to one. Ratios of fifty to one may be a scale where enforcement actions could be more easily justified.

At this stage, treating a grade crossing occurrence differently than any other occurrence would probably be qualified as "overkill" by federal/provincial/territorial road safety authorities.

6.4 CCMTA Conviction Equivalency Table

This research revealed the existence of a Conviction Equivalency Table developed by the CCMTA in 1997. The need for uniform treatment and severity of treatment for contraventions has long been recognized by the CCMTA. The purposes of the table are as follows:

- Allow for coordination of convictions committed by drivers and carriers to exchange information in a standardized format;
- Provide sufficient generic coding and categories to ensure the comprehensive exchange of convictions;
- Provide assurance to the jurisdiction in which the conviction occurred that the conviction can be more easily understood by the receiving jurisdiction through the use of a standard format;
- Provide a reference matrix that eliminates the need for continual cross-referencing of other jurisdictions' legislation and regulations;
- Provide a comprehensive list of generic codes;
- Provide clarification as to the nature of the offence.

The CCMTA table is currently used in the three Prairie Provinces and, to a certain extent, all provincial/territorial jurisdictions have used it in establishing their safety assessment regimes. However, provinces like New Brunswick, Ontario and Quebec have chosen not to use the Conviction Equivalency Table at this stage.

The CCMTA Conviction Equivalency Table contains only two grade crossing violations. For both violations, the treatment recommended is three demerit points: the maximum number of points for violations other than Criminal Code violations.

6.5 Commercial Driver Profile

Canada has had a uniform driver's licence for many years and the question of multiple licences being used by commercial drivers does not exist. Furthermore, all provincial and territorial jurisdictions have established a system of demerit points. These points are part of a driver's profile or abstract.

Violations to highway traffic regulations pertaining to grade crossings are treated the same as any other infraction. The violation is noted on the driver's profile and demerit points are assessed. This is, of course, in addition to the points assessed to the motor carrier for which that driver was working at the time.

Points assessed in a driver's profile can also lead to sanctions such as the suspension of a driver's licence. It is the responsibility of the motor carrier to check the profiles of its drivers to make sure that they are up to date. Generally speaking, motor carriers have used a release form for years allowing them to access their employees' driver profiles. Drivers usually sign this release form when starting employment for a motor carrier.

Contraventions will also trigger reactions on the part of insurance companies, who usually reward a good driving record with lower premiums and increase premiums for drivers with bad driving records. The same is true for provinces where there is a government insurance plan in place. The assessment of demerit points results in an increase in insurance premiums. In Quebec, for instance, insurance premiums increase as follows:

Demerit points	Premium paid every second year (Cdn$)
1 - 3	22.94
4 - 7	45.87
8 - 11	79.82
12 - 14	131.19
15 or more	182.57

Generally speaking, all driver infractions result in a loss of three to nine points on a driver's profile.

Table 9 - Demerit Points Assessed to Commercial Drivers for Grade Crossing Contraventions – Quebec

Contraventions	Demerit Points
Failure to stop at grade crossings	3
Failure to stop at grade crossings – Bus and school bus drivers	9

In the Province of Quebec, for all commercial vehicle drivers, failure to stop at grade crossings results in an assessment of three points. Bus and school bus drivers failing to stop at a grade crossing are assessed an additional six points. In addition, fines of up to $500 may be imposed. As Section 8 reveals, this approach differs from the approach recently taken in the United States where commercial driver's licence is suspended when a grade crossing contravention is committed. In Canada, a commercial driver's licence is suspended only when a total of 15 points have been accumulated over a sliding window period of two years.

A contravention at a grade crossing would therefore not disqualify a commercial driver unless that driver had accumulated enough points prior to pleading guilty to this new contravention. This nuance is significant because a long period of time may elapse between a court decision on a contravention and the day that infraction took place.

The link between driver profiles and motor carrier profiles exists in an implicit way. It is up to any motor carrier to verify its drivers' abstracts or driver profiles. While it is possible to make the link between the driver's profile and the motor carrier's profile more explicit, this would not serve any specific purpose or resolve any major issues at this time.

7. INDUSTRY VIEWS ON SAFETY AT GRADE CROSSINGS

The motor carrier industry is generally concerned about occurrences at grade crossings. Some carriers take an active role in the promotion of safety at grade crossings by participating in local safety leagues and similar safety organizations. However, because there are so few occurrences involving commercial vehicles at grade crossings, grade crossing safety is not a pressing priority. It was found that the material produced by Operation Lifesaver does not reach many representatives of the trucking industry. Operation Lifesaver is a not-for-profit organization dedicated to informing the public about the risks involved with grade crossings. It also produces information and educational material on safety at grade crossings. Over the years, Operation Lifesaver has produced a variety of information and educational material for commercial vehicle operators, including a video entitled *The Gallery*.

In the course of this project, five motor carriers, one insurance company and a school bus operator were interviewed:

- Bourassa Transport
- Economy Carriers
- Orléans Express
- Robert Transport
- Thomson Terminals
- Markel Insurance of Canada
- New Brunswick Department of Education-School Bus Coordinator

Bourassa Transport is an LTL motor carrier based in Saint-Jean-sur-Richelieu, Quebec, and it has more than 125 employees. It operates between Quebec, Ontario and the United States, and employs a few owner-operators for long-haul transport. In 1997, Bourassa had one accident at a grade crossing in the United States. Its main terminal is very close to a rail mainline so drivers are generally aware of the risk involved. Following the 1997 accident, Bourassa Transport implemented a procedure requiring drivers to lower their side window at railway crossings and listen for train whistles. The company was not aware of the information available under Operation Lifesaver.

Economy Carriers is based in the province of Alberta. It operates more than 350 commercial power units and specializes in the bulk transport of dangerous goods. It has three divisions: fuel, waste and freight. It has not yet had an accident at a grade crossing. For some time now, the company has been inviting railway company representatives to speak to its drivers each year about Operation Lifesaver. It is quite familiar with the Operation Lifesaver material, including the video *The Gallery*.

Orleans Express is based in Montreal, Quebec, and operates both scheduled and charter bus service. It has approximately 60 motorcoaches on its scheduled runs. Its charter division is known as Autocars Dupont. Buses are required by law throughout Canada to stop at all railway crossings. The company administers its own training school and has developed a training procedure for grade crossings that requires its drivers to stop the vehicle, open the door and listen.

Robert Transport is a for-hire fleet based in Boucherville, Quebec, operating 1000 power units. It employs 825 drivers and just over 200 owner-operators. The company offers an interesting feature regarding grade crossing – it has a private rail crossing in the middle of one of its main yards in Boucherville. Robert Transport was aware of Operation Lifesaver but not specifically of the information it produces.

Robert Transport's personnel could not recollect having had a single accident or violation at a grade crossing. The company is concerned about safety at grade crossings and its safety information program contains material on the subject. It has five full-time trainers on staff and offers a full range of training programs to its employees. Its training program on dangerous goods deals with Quebec regulations regarding mandatory stops at grade crossings when transporting placardable quantities of dangerous goods. It has been involved in the development of a motor carrier safety assessment for the Province of Quebec and is well aware of the processes involved.

Thomson Terminals is based in Mississauga, Ontario, and operates between central Canada and the United States. It has approximately 150 power units with a mix of employee drivers and owner-operators. As a general procedure at the time of hiring, the company does remind its drivers to be careful at grade crossings. Thomson Terminals was not aware of the Operation Lifesaver material. It believes that the process of railway rationalization over the past years has meant fewer grade crossings for Ontario-based carriers.

Markel Insurance Company of Canada specializes in insuring commercial transport fleets and has more than 400 transport fleets as clients. Markel also operates a training school for commercial drivers in Guelph, Ontario. It is familiar with Operation Lifesaver. The company usually gets involved in accidents when the property damage is more than $5000, as this is the lowest deductible for most motor carriers' insurance policies. Because Markel has had very few claims from its clients concerning that type of occurrence it does not consider occurrences at grade crossings to be a pressing issue.

In New Brunswick, the vast majority of school buses are owned and operated by the **New Brunswick Department of Education**. According to the Department's statistics, 1200 school buses are operated each day during the school year in New Brunswick. Of this total, 1100 are operated and owned by the Department of Education. Therefore, most of the school bus drivers in New Brunswick are government employees.

This situation is not a typical one since, for most other provinces and territories, school buses are owned and operated by private companies.

In New Brunswick, all new school bus drivers must go through a week-long training program. Grade crossing practices and regulations are a part of that program. The Department complains, however, that the province's driver handbook does not contain any pictures showing grade crossing signs. Experiences school bus drivers must undergo an eight-hour refresher training program once a year and grade crossing safety is a part of that program as well.

The training emphasizes the need to open doors and windows at grade crossings. It also reinforces the fact that commercial drivers are not allowed to change gears while driving school buses and crossing railway tracks.

The persons responsible for school bus safety and training at the Department of Education were aware of some safety problems at grade crossings. These problems did not lead to any occurrences and corrective actions were taken with the drivers involved.

Department officials were not aware of provincial initiatives to assess the performance of commercial vehicle operators. They believe that, generally speaking, because most school buses in New Brunswick are owned and operated by the Department of Education, their vehicles are not treated in the same manner as other commercial vehicles. They do think, however, that this should change and that governmental commercial vehicles and drivers should be subject to the same penalties and sanctions as other commercial vehicles and drivers.

The Department makes use of Operation Lifesaver material as part of its training program and believes it needs to expand on that program by recruiting three master trainers to cover the province. It is also keen to support the development of a new national network of organizations involved in school bus transportation. The first meeting of this new network took place last year in St John, New Brunswick. The next meeting is scheduled for Penticton, British Columbia, in May 2002.

It is clear from these discussions that most motor carriers are doing something to minimize the risk of occurrences at grade crossings. It seems that although provincial safety leagues have traditionally played a stronger role in commercial driver training, the Operation Lifesaver program is better known and more likely to be used. It also clear that the issue of grade crossing contraventions is not high on their list of priorities.

All industry representatives thought that although the issue of safety at grade crossings is a serious matter, they consider the current safety assessment and rating to be sufficient. None of the motor carriers were aware of the difference in treatment given to grade crossing occurrences and contraventions by different jurisdictions. All were surprised to hear that in 1999 there was a total of 49 occurrences at grade crossings involving commercial vehicles.

8. OVERVIEW OF SITUATION IN THE UNITED STATES

In the United States, grade crossings are the responsibility of state and municipal governments and railroad operators. The United States' approach to motor carrier safety rating and violations at grade crossings differs somewhat from Canada's. In the United States, the federal government is responsible for railroad regulations and safety regulations for the operation of a commercial vehicle used for interstate commerce. The agency responsible for the administration of the motor carrier industry is the Federal Motor Carrier Safety Administration (FMCSA). The Federal Highway Administration (FHWA) is also involved in grade crossings but only for infrastructure projects such as grade separation.

The FMCSA is responsible, among other things, for the assessment of the safety rating of motor carriers and for the establishment of railroad crossing rules for drivers and motor carriers.

The Federal Railroad Administration (FRA) is responsible for rail regulations; therefore, safety rules governing grade crossing operations fall under the FRA.

8.1 Motor Carrier Safety Assessment Process

The United States has also established procedures to determine the safety fitness of motor carriers and assigns safety ratings using three categories: satisfactory, conditional and unsatisfactory. The factors considered in determining the safety fitness of motor carriers are as follows:

- Adequacy of safety management controls;
- Frequency and severity of regulatory violations;
- Frequency and severity of vehicle/driver regulatory violations identified in roadside inspections;
- Number and frequency of out-of-service driver/vehicle violations;
- Increase or decrease in similar types of regulatory violations discovered during safety or compliance reviews;
- Frequency of accidents, hazardous materials incidents, accident rate per million miles and other accident indicators;
- Number and severity of violations of state safety rules, regulations, standards and orders compatible with federal rules, regulations, standards and orders.

The FMCSA also uses a methodology to a weigh motor carrier's size and operational characteristics.

The FMCSA uses a tool called SafeStat (Safety Status Measurement System) to assist in establishing priorities for compliance review of motor carriers. SafetStat is an automated, data-driven analysis system designed to incorporate current on-road safety performance information on all motor carriers with on-site compliance review and enforcement history information to measure relative motor carrier safety fitness.

SafeStat output is called a Safety Evaluation Area value. It currently uses the following data:

- State-reported commercial vehicle crash data;
- Compliance reviews following on-site inspections;
- Violations resulting from on-site inspections;
- Violations resulting from roadside inspections;
- Motor carrier census data.

The following regulations are used in compliance review by federal and state inspectors:

- Drug and alcohol testing;
- Commercial driver's licence standards;
- Minimum insurance;
- Qualifications of drivers;
- Driving of motor vehicles;
- Parts and accessories necessary for safe operations;
- Hours of service;
- Inspection, repair and maintenance;
- Hazardous materials.

SafeStat uses normalized safety-event data to measure the safety compliance and performance of individual motor carriers. Carrier size and exposure are taken into account. Some data are also weighted to take severity into account. For instance, a crash with property damage only is assigned one point, whereas an accident with injuries and fatalities is assigned two points.

The primary use of SafeStat is to identify and prioritize motor carriers for FMCSA and state safety enforcement programs. A link to SafeStat is available to the public via the Internet on FMCSA's website under the keyword Analysis & Information Online.

FMCSA officials stated that they currently do not take grade crossing violations into account in their ratings and SafeStat system. Occurrences at grade crossings are recorded just as any other accident as long as they are reported.

8.2 Grade Crossing Contraventions

Grade crossing contraventions are focused on drivers and occurrences. Driver infractions at grade crossings have been investigated by the FHWA under a mandate spelled out in the *Interstate Commerce Commission Termination Act of 1995*. The Act required the FHWA to develop rules, including sanctions and penalties, to improve truck driver behaviour at rail crossings. Subsequent to a major accident in March 1998, when an Amtrak train hit a steel-hauling tractor trailer killing 11 train passengers and injuring more than 100 others, the FHWA issued a rulemaking notice. New regulations were introduced in 1999.

This rulemaking established new railroad crossing rules and imposed new penalties on commercial drivers. Under these rules, commercial drivers are subject to the following penalties:

- For a first violation, suspension of the Commercial Driver's License (CDL) for at least 60 days;
- For a second violation within three years, the suspension period is at least 120 days;
- For a third violation within the three-year period, the suspension period is at least one year.

The rules further state that a motor carrier that knowingly permits or requires a driver to violate any of these rules is subject to a fine of up to $10,000.[1] The actual penalties are decided by the court system where the infraction took place.

Drivers can be disqualified from driving if they commit one of the following contraventions:

- Failing to slow down and ensure the tracks are clear of an approaching train;
- Failing to stop if a train is approaching;
- Hazardous materials carriers and passenger vehicles failing to stop at any crossing, which they must do under current law;
- Failing to have sufficient space to drive completely through a crossing without stopping;
- Failing to obey a traffic control device or directions of an enforcement official;
- Failing to negotiate a crossing because of insufficient undercarriage clearance.

At the request of state governments, a three-year grace period (until 2002) was granted before these new rules take effect to give states time change their laws to meet these new standards. Failure to do so could mean a loss of FMCSA Program funds.

More recently, the FMCSA proposed new rulemakings that would disqualify commercial drivers from driving if they are convicted of certain offences while driving any vehicle. The proposed rulemaking would require states to disqualify a driver's CDL upon conviction, and employers would be required to prohibit these disqualified drivers from operating commercial motor vehicles. The purpose of the proposal is to improve safety by ensuring that only safe drivers operate large trucks and buses. One of the offences that would disqualify a convicted driver is violating railroad-highway grade crossing signs.

8.3 Summary – United States

In the United States, the emphasis for actions regarding grade crossing contraventions is on drivers. Grade crossing violations are not tied to U.S. DOT motor carrier safety ratings. The arduous task of data transfer from states, railroad companies and municipalities is raised as an obstacle for pursuing this issue.

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[1] J. Thomas, "New CDL Rules for Railway Crossing Infractions", *Commercial Carrier Journal*, October 1999, p. 10.

This emphasis on drivers also means that, as in Canada, the cooperation of local authorities is needed. If all states endorse the approach and bring in the enabling legislation, then the measure may be an incentive for caution on the part of drivers at grade crossings. It is premature to know whether this measure will help to reduce occurrences at grade crossings involving commercial vehicles.

The FRA also plays a role in the safety of grade crossings from a highway perspective by maintaining a database referred to as a hazard index. This index takes into account occurrences at all grade crossings and then rates each crossing from a risk perspective. This data is used for infrastructure projects at grade crossings.

In summary, U.S. regulators do not single out grade crossing violations as part of their carrier risk assessment. They enter grade crossing occurrences as they would any other occurrences. At the moment, the FMCSA conducts 10,000 to 12,000 compliance reviews a year. It is under pressure from a law passed by Congress in 1999 (the *Motor Carrier Safety Improvement Act of 1999*) to introduce new entry requirements. Should they be forced to do compliance reviews for new entrants, an additional 40,000 per month would be required.

It also appears that the United States has not yet researched the manner in which it could treat both occurrences and contraventions at grade crossings as part of the motor carrier safety rating process.

9. CONCLUSIONS AND RECOMMENDATIONS

It appears that the issue of grade crossing contraventions and occurrences has not received much attention during the debates across Canada on motor carrier safety assessment and rating. With so few occurrences involving commercial vehicles at grade crossings, the statistics tend to support those who favour the status quo. Furthermore, over the past several years, there has been a reduction in occurrences involving commercial vehicles at public grade crossings.

At the same time, Direction 2006 provides an opportunity to bring guidance and focus to all concerned with improving transportation safety. The area of commercial vehicle safety at grade crossings can benefit from the fact that the operators and drivers of these vehicles are subject to safety assessments and safety rating processes. These processes provide a focus for action in enabling enforcement agencies to properly identify the "offenders" at grade crossings. Furthermore, these processes will soon be national and international in scope.

There is no doubt that all parties involved treat occurrences and contraventions involving commercial vehicles at grade crossings seriously. However, because there are so few occurrences, the issue has not been given high priority in the new motor carrier safety assessment and safety rating regimes. Nevertheless, provincial officials are not adverse to reviewing this issue if increased safety is the underlying objective and outcome of the review.

It was noted that contraventions at grade crossings are treated differently in Canada and the United States. In the United States, severe sanctions are focused squarely on drivers whereas in Canada, the sanctions are focused more on motor carriers and, to a lesser extent, on commercial drivers.

To achieve increased safety in line with Direction 2006 objectives of a 50 percent reduction of occurrences at grade crossings by 2006, the following three areas could lend themselves to action:

Statistics: Proper identification of the characteristics of the motor carriers and commercial drivers involved in grade crossing occurrences and contraventions would aid in targeting future actions for their reduction. This would probably be a normal evolution of the statistics currently being collected. Some years ago there was a debate on how the statistics for commercial vehicles involved in occurrences were tabulated. The complaint was that the term "truck", was too broad and general. That situation has now been corrected. It now may be time to obtain more information about the characteristics of the motor carrier companies and drivers involved. Without this refinement in the statistics gathered, it is difficult to properly target any program. It should be noted that a certain level of detail already exists in provincial police reports.

This refinement is also important in view of the heterogeneity of the motor carrier industry. The vast majority of commercial vehicle operators are small corporations operating fewer than 10 vehicles. In some provinces more than 80 percent of transport *fleets, both for-hire* and private fleets, operate fewer than 10 vehicles. The number of corporations and individuals involved is in the hundreds of thousands. In terms of vehicles, it is estimated that more than 750,000 commercial vehicles are operated in Canada. There are also U.S.-based commercial vehicles crossing the border that add to this total.

To properly identify the "offenders" and develop proper communications and enforcement campaigns, any refinement to the statistics gathered would help to further refine the motor carrier safety assessment and motor carrier rating processes.

Moreover, although grade crossing occurrences and contraventions occurring at provincially regulated railroads are accounted for within provincial regimes, they are not included in TSB statistics. This means that should these occurrences be included, the number of occurrences at grade crossings as reported by TSB might be slightly higher.

Regulations: This was one of the focus areas for this project, which has shown that grade crossing occurrences and contraventions are incorporated in current Canadian motor carrier safety assessment and rating regimes. The fact that it may have been given a low priority may reflect the small number of occurrences as a proportion of the total number of occurrences involving commercial vehicles. However, it has been shown that occurrences and contraventions involving commercial vehicles at grade crossings do take place. The risk they pose must also be taken into consideration.

What was found was more a lack of uniformity in both the types and treatment of contraventions included in motor carrier safety assessment rather than a lack thereof.

There are mechanisms that can be used to correct this lack of uniformity in treatment. Federal regulations would seem to provide an avenue for uniform treatment by provincial regimes. The case of Criminal Code violations supports this hypothesis. However, insertion of regulatory language under the MVTA to deal specifically with grade crossing occurrences and contraventions would probably be considered an extreme solution.

The existence of the CCMTA Conviction Equivalency Table indicates that a considerable amount of work has already taken place on the issue of uniform identification of contraventions and sanctions. It seems that the best alternative for uniform treatment is to build on this work. In this particular case, the CCMTA table could be a useful tool in providing the following:

- Definition of the types of grade crossing contraventions to be included in motor carrier assessment across Canada;
- Uniform language for all grade crossing contraventions included in the CCMTA table;
- Uniform assessment of the severity of the grade crossing contraventions and occurrences.

Uniformity in the types and treatment of grade crossing contraventions across Canada may be the first step in establishing a role for grade crossing contraventions in the motor carrier safety rating process.

This work would also help to better understand the difference in approaches taken in Canada and the United States on this issue.

Communications: Industry interviews have shown that not everybody in the motor carrier community is aware of Operation Lifesaver. This should be corrected with a campaign in partnership with organizations that work closely with the motor carrier community. However, since not much is known about the characteristics of the operators involved in grade crossing occurrences and contraventions, it is difficult to focus on that particular aspect at this stage. What tools and media should be used to reach the individuals more likely to take risks at grade crossings? This is a fundamental question since preaching to the converted would not provide an optimal return on investment. The issue of communications is therefore linked closely to the issue of improved statistics.

In the meantime, one action that could be taken to reach many commercial vehicle operators would be to distribute information material on grade crossing safety through alliances with companies that distribute products to all commercial vehicle operators regardless of the size of vehicles they use. Oil companies as well as vehicle and engine manufacturers could provide excellent distribution channels to all commercial vehicle operators.

Another action could be to have a booth with relevant material at truck shows across Canada. Many commercial vehicle operators attend these shows and take the time to visit kiosks as long as the material presented is relevant to them.

Truck stops also present a good opportunity to reach commercial vehicle operators. For instance, placemats used in these facilities have proven their effectiveness as useful communication tools for other safety campaigns such as the Share the Road campaign.

In summary, this project recommends different actions to all parties interested in improving safety at grade crossings:

- Better characterization of commercial vehicle operators involved in grade crossing contraventions and occurrences to identify the offenders;
- Clear description of the types of contraventions at grade crossings to be included in motor carriers' safety assessment;
- Uniform treatment of demerit points given for contraventions;
- Clear description of commercial driver crossing contraventions including type and definition;
- Wider diffusion of Operation Lifesaver material to reach as many commercial vehicle operators as possible. The use of place mats at truck stops is one action that can reach many commercial vehicle operators.

The project confirmed that all parties concerned take grade crossing occurrences as a serious safety concern and are willing to cooperate to improve transportation safety in general. Any action taken to identify and eliminate the "offenders", however incremental in nature, can only help and support Direction 2006 objectives.

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APPENDIX A

PROVINCIAL HIGHWAY TRAFFIC ACTS AND REGULATIONS, AND RELEVANT *RAILWAY SAFETY ACT* SECTIONS

This section contains legislative provisions related to driving offences at railway crossings for British Columbia, Alberta, Saskatchewan, Ontario, Quebec, New Brunswick, and Nova Scotia. It also contains related federal legislation under the *Railway Safety Act*, including provisions from the *Contraventions Regulations*.

British Columbia

Motor Vehicle Act, R.S.B.C. 1996, c. 318.

Railway Crossings

185 (1) When a driver is approaching a railway crossing at a time when

(a) a clearly visible electrical or mechanical signal device gives warning of the approach of a railway train,

(b) a crossing gate is lowered or a flagger is giving a signal of the approach or passage of a railway train, or

(c) a railway train is approaching and is within approximately 500 m of a crossing or by reason of its speed or nearness to the crossing is an immediate hazard and emits an audible signal or is visible,

the driver must stop the vehicle within 15 m but not less than 5 m from the nearest rail of the railway, and must not cause or permit the vehicle to proceed until he or she can do so safely.

(2) A person must not drive a vehicle through, around or under a crossing gate or barrier at a railway crossing while the gate or barrier is closed or is being opened or closed.

(3) If a stop sign is erected at a railway crossing, a driver approaching the railway crossing

(a) must stop his or her vehicle

(i) no closer than 5 m, and

(ii) no farther than 15 m from the nearest rail of the railway, and

(b) must not proceed until he or she can do so safely.

(4) Except at a railway spur line or an industrial track in a business or residence district, the driver of

(a) a bus carrying passengers for compensation,

(b) a school bus carrying a child,

(c) a vehicle carrying explosive substances or any poisonous or flammable substance as cargo, or

(d) a vehicle used to carry flammable liquids or gas, whether or not it is then empty,

approaching a railway crossing that is not protected by gates or railway crossing signal lights, unless otherwise directed by a flagger, must

(e) stop his or her vehicle

(i) no closer than 5 m, and

(ii) no farther than 15 m from the nearest rail of the railway,

(f) remaining stopped, must listen and look in both directions along the railway for an approaching train, and for signals indicating the approach of a train, and

(g) must not proceed until he or she can do so safely.

(5) When a driver has stopped in accordance with this section, the driver must

(a) cross the railway tracks in a gear that he or she will not need to change while crossing the tracks,

(b) not shift gears while so crossing, and

(c) not stop with a part of the vehicle on or over the tracks.

(6) Despite this Act, the driver of a vehicle approaching the track of a railway must proceed with caution to avoid a collision between the vehicle and an approaching train.

When vehicle stopping prohibited

189 (1) Except when necessary to avoid conflict with traffic or to comply with the law or the directions of a peace officer or traffic control device, a person must not stop, stand or park a vehicle as follows:

(i) within 15 m of the nearest rail of a railway crossing;

Alberta
Highway Traffic Act, R.S.A. 1980, c. H-7.

Railway Crossing

104 (1) At a railway crossing at any time when

(a) a clearly visible electrical or mechanical signal device gives warning of the approach of a railway train,
(b) a crossing gate is lowered or a flagman is giving a signal of the approach or passage of a railway train,
(c) a railway train within approximately 500 metres of the crossing is approaching the crossing and either sounds an audible signal or is visible, or
(d) a railway train is visible and approaching the crossing and by reason of its speed or nearness is an immediate hazard,

a driver approaching the railway crossing

(e) shall stop his vehicle no closer than 5 metres from the nearest rail of the railway, and
(f) shall not proceed until the train
    (i) has passed by the railway crossing, or
    (ii) has come to a stop,

and he can safely proceed.

(2) No person shall drive through, around or under a crossing gate or barrier at a railway crossing while the gate or barrier is closed or is being opened or closed.

(3) If a stop sign is erected at a railway crossing, a driver approaching the railway crossing

(a) shall stop his vehicle
    (i) no closer than 5 metres, and
    (ii) no further than 15 metres,

from the nearest rail of the railway, and

(b) shall not proceed until he can do so safely.

(4) In the case of a railway crossing that is not controlled by a traffic control signal, the driver of a vehicle that

(a) is a school bus,
(b) is carrying explosive substances as cargo, or
(c) is used for carrying inflammable liquids or gas, whether or not it is then empty,

shall stop the vehicle no closer than 5 metres or further than 15 metres from the nearest rail of the railway, and

(d) remaining stopped, shall listen and look in both directions along the railway for an approaching train and for signals indicating the approach of a train,
(e) shall not proceed until he can do so safely, and
(f) in the case of a school bus, shall before proceeding open the front door and if practicable to do so with one hand, shall also open the window immediately to his left.

(5) Subsection (4) does not apply when a peace officer or a flagman otherwise directs.

(6) The council of a city may, by by-law, provide that subsection (4) does not apply to all or any railway crossings in the city.

(7) When a driver has stopped in accordance with this section he

(a) shall cross the railway tracks in a gear that he will not need to change while crossing the tracks, and
(b) shall not shift gears while so crossing.

RSA 1980 cH-7 s104

Punishment

169 (1) Except as otherwise provided in this Act, a person who is guilty of an offence under this Act or the regulations for which a penalty is not otherwise provided is liable to a fine of not more than $500 and in default of payment is liable to imprisonment for a term not exceeding 6 months or to imprisonment for a term not exceeding 6 months without the option of a fine.

Saskatchewan

Highway Traffic Act, S.S. 1986, c.H-3.1

Railway Crossing
Stopping

40 (4) The driver of a vehicle shall bring the vehicle to a stop:

(a) at every place where a stop sign is erected;

(b) when approaching a railway crossing, and a signal person or automatic signal indicates the approach of a train; or

(c) when directed to do so by a school crossing guard patrolling a crosswalk pursuant to subsection 188(4) of The Education Act.

(5) The driver of:

(a) a bus transporting passengers; or

(b) a vehicle that is transporting goods in an amount that requires the vehicle to be placarded pursuant to regulations made pursuant to The Dangerous Goods Transportation Act;

(c) Repealed. 1989-90, c.10, s.9.

shall bring the vehicle to a stop before proceeding over a level railway crossing.

(6) No person who is required to stop pursuant to subsection (4) or (5) shall proceed until it is safe to do so.

(7) Subsection (5) does not apply if an automatic signal is erected at the railway crossing and the signal indicates that it is safe to proceed.

Penalty

General offence and penalty

94 Any person who contravenes any provision of this Act or the regulations for which no other penalty is specifically provided, or who disobeys an order of the board, is guilty of an offence and liable on summary conviction:

(a) in the case of an individual, to a fine of not more than $1,000;

(b) in the case of a corporation, to a fine of not more than $2,000.

1986, c.H-3.1, s.94.

Manitoba

Highway Traffic Act, S.M. 1986, c.3 - Chap.H60

Railway Crossings

134(1) When a driver is approaching a railway crossing

(a) where a “stop” or “arrêt” sign has been erected at the crossing, he shall stop the vehicle

(i) not less than 5 metres from the nearest rail of the railway if the crossing is in a restricted speed area, and

(ii) not less than 15 metres from the nearest rail of the railway if the crossing is not in a restricted speed area,

and he shall not proceed unless he can do so in safety;

(b) when a clearly visible electrical or mechanical traffic control device gives warning of the approach of a railway train, he shall stop the vehicle as required by clause (a) and he shall not proceed while any such signal continues to give warning, unless a peace officer or flagman otherwise directs and he can do so in safety; but where the railway crossing is in a restricted speed area and the train is stopped or not in close proximity to the crossing, the driver may proceed to cross the railway crossing if he can do so in safety;

(c) when a crossing gate is lowered or a flagman is giving a signal of approach or passage of a railway train, or a railway train is in dangerous proximity to the crossing and is giving an audible signal or is visible, he shall stop the vehicle as required by clause (a) and he shall not proceed while the gate is lowered or the flagman continues to give warning of approach of a railway train, unless a peace officer or a flagman otherwise directs and he can do so in safety.

Definition of "flagman"

134(2) In this section and in section 135 **"flagman"** includes a brakeman or other trainman on a train of a railway who, in connection with the operation of a train, is warning people on a highway.

Stops by certain vehicles at railways

135(1) Except as provided in subsections (3) and (4), the driver of

(a) a vehicle carrying passengers for compensation; or
(b) a school bus carrying children; or
(c) a vehicle carrying flammable liquids or gas, whether or not it is empty;

approaching a railway crossing shall stop the vehicle not less than 5 metres, or more than 15 metres, form the nearest rail of the railway, and, with the vehicle stopped, shall

(d) look in both directions along the railway for an approaching train;
(e) listen for signals indicating the approach of a train; and
(f) in the case of a bus or school bus, open the door of the vehicle;

and he shall not proceed unless he can do so in safety.

Crossing railway without changing gear

135(2) Except as provided in subsection (4), where a driver has stopped and is proceeding as required in subsection (1), he shall cross the railway track in a gear that he will not need to change while crossing the track, and he shall not shift gears while crossing.

Where subsection (1) does not apply

135(3) Subsection (1) does not apply where

(a) a peace officer or a flagman directs traffic to proceed; or
(b) the crossing is protected by gates or a railway crossing signal light which are not in operation at the time.

Where subsections (1) and (2) not applicable

135(4) Subsections (1) and (2) do not apply to

(a) street railway grade crossing within a restricted speed area; or
(b) industrial spur railway crossings within a restricted speed area.

Driving through railway barrier

190(2) No person shall drive a vehicle through, around, or under a crossing gate or barrier at a railway crossing while the gate or barrier is closed or is being opened or closed.

General penalty for miscellaneous offences

239 Any person who violates, contravenes, or disobeys or refuses, omits, neglects, or fails to observe, obey, or comply with

(a) any provision of this Act or of the regulations; or
(b) any municipal by-law duly passed under the authority of this Act; or
(c) any order of a peace officer, other than an order of a peace officer under section 76.1, any order of a traffic authority, the traffic board, the transport board, or other authority or person, lawfully given by him or it under this Act, or indicated or conveyed by a traffic control device;

is guilty of an offence and, unless another penalty is prescribed therefor herein or in any such by-law or regulation, is liable, on summary conviction, to a fine of not more than $500 and to suspension of licence for a term of not more than 30 days.

S.M. 1989 90, C.4, S.6; SM 1996, C.26, S.17.

Ontario

Highway Traffic Act, R.S.O. 1990, c. H.8.

Amended by: S.O. 1992, c. 20, s. 2; S.O. 1993, c. 8; S.O. 1993, c. 13, s. 1; S.O. 1993, c. 18; S.O. 1993, c. 7, Sched.; S.O. 1993, c. 31, s. 2; S.O. 1993, c. 34, S.O. 1993, c. 40; S.O. 1994, c. 27, s. 138; S.O. 1994, c. 28; S.O. 1994, c. 29; S.O. 1994, c. 35; S.O. 1996, c. 1, Sched. E, s. 2; S.O. 1996, c. 9, s. 26; S.O. 1996, c. 20, ss. 1, 2, 3, 5, 7-10, 13-21, 23-30; S.O. 1996, c. 32, s. 71; S.O. 1996, c. 33, ss. 1-11, 13-17; S.O. 1997, c. 12; S.O. 1996, c. 31, ss. 68-70; S.O. 1997, c. 4, s. 81; S.O. 1997, c. 26, Sched.; S.O. 1998, c. 5, ss. 25-27; S.O. 1998, c. 6; S.O. 1997, c. 41, s. 120; S.O. 1998, c. 35, s. 103; S.O. 1998, c. 18, Sched. G, s. 56; S.O. 1998, c. 28, s. 67; S.O. 2000, c. 38, ss. 1(1), (2), 2(1), (2), 3(1), 4, 5(1), (2), 6; S.O. 1999, c. 12, Sched. B, s. 9, Sched. R, s. 3; S.O. 1999, c. 13; S.O. 1999, c. 8, s. 7; S.O. 1999, c. 12, Sched. G, s. 24; S.O. 2000, c. 15, s. 1.

Vehicles required to stop at railway crossing signal

163. When the driver of a vehicle is approaching a railway crossing at a time when a clearly visible electrical or mechanical signal device or a flagman is giving warning of the approach of a railway train, he or she shall stop the vehicle not less than 5 metres from the nearest rail of the railway and shall not proceed until he or she can do so safely. R.S.O. 1990, c. H.8, s. 163.

Driving of vehicles under crossing gates prohibited

164. No person shall drive a vehicle through, around or under a crossing gate or barrier at a railway crossing while the gate or barrier is closed or is being opened or closed. R.S.O. 1990, c. H.8, s. 164.

Public vehicles required to stop at railway crossings

174. (1) The driver of a public vehicle upon approaching on a highway a railway crossing that is not protected by gates or railway crossing signal lights, unless otherwise directed by a flagman, shall,

(a) stop the vehicle not less than 5 metres from the nearest rail of the railway;
(b) look in both directions along the railway track;
(c) open a door of the vehicle and listen to determine if any train is approaching;
(d) when it is safe to do so, cross the railway track in a gear that will not need to be changed while crossing the track; and
(e) not change gears while crossing the railway track.

School buses required to stop at railway crossings

(2) The driver of a school bus, within the meaning of section 175, upon approaching on a highway a railway crossing, whether or not it is protected by gates or railway crossing signal lights, unless otherwise directed by a flagman, shall,

(a) stop the school bus not less than 5 metres from the nearest rail of the railway;
(b) look in both directions along the railway track;
(c) open a door of the school bus and listen to determine if any train is approaching;
(d) when it is safe to do so, cross the railway track in a gear that will not need to be changed while crossing the track; and
(e) not change gears while crossing the railway track. 1997, c. 12, s. 13.

General penalty

214. (1) Every person who contravenes this Act or any regulation is guilty of an offence and on conviction, where a penalty for the contravention is not otherwise provided for herein, is liable to a fine of not less than $60 and not more than $500.

Penalty for other offences in community safety zone

(8) Every person who commits an offence in contravention of any of sections 132 to 164, inclusive (except subsections 140(4) and (6) and subsections 144(22) to (29), inclusive), section 166, 167, 168 or 169, subsection 176(3) or section 182 in a community safety zone when it is in effect is liable, on conviction, not to the penalty otherwise applicable, but to a fine of not less than double the minimum fine otherwise applicable and not more than the maximum fine otherwise applicable.

Quebec

Highway Safety Code L.R.Q. 2000, c. C-24.2.

Level Crossing

Failure to come to a mandatory stop at a level crossing – 3 demerit points

Failure to stop at a level crossing when driving a bus, a minibus or a road vehicle equipped for the transport of dangerous substances, OR setting such a vehicle in motion again when prohibited – 9 demerit points

Prohibited stopping

386. Except in cases of necessity or where another provision of this Code permits it, no person may stop a road vehicle

(4) at an intersection, on a pedestrian crosswalk clearly identified as such and on a level crossing or less than 5 metres therefrom;

1986, c. 91, s. 386; 1987, c. 94, s. 57; 1990, c. 83, s. 150; 1993, c. 42, s. 7.

Level crossing

411. At a level crossing, the driver of a road vehicle or any person riding a bicycle must stop his vehicle not less than 5 metres from the railway where a sign or signal, a lowered gate or a railway employee signals an approaching rail vehicle, or where the driver or cyclist sees or hears a rail vehicle approaching the level crossing.

1986, c. 91, s. 411.

Insufficient space

412. Even if so authorized by traffic lights, no driver of a road vehicle may enter a level crossing if there is not sufficient space ahead of the vehicle to allow him to cross the level crossing.

1986, c. 91, s. 412.

Level crossing

413. The driver of a bus, minibus or road vehicle carrying certain categories of dangerous substances determined by regulation must stop his vehicle not less than 5 metres from any level crossing. The driver may then proceed only after ascertaining that he may do so in safety.

Exemption

The driver is exempt from the obligations under the first paragraph at level crossings where so indicated by a sign or signal.

1986, c. 91, s. 413.

Exemption

414. The Minister of Transport may, by an order published in the *Gazette officielle du Québec*, designate certain level crossings where the driver of a road vehicle referred to in section 413 is exempt from the obligations under the said section.

1986, c. 91, s. 414.

Offence and penalty

506. Every person who contravenes section 324, the second paragraph of section 325, any of sections 336, 339, 351 to 358, 366, 372 to 376, 381 to 385, paragraphs 1 to 7, 8 and 9 of section 386, section 387, the third paragraph of section 407, any of sections 412, 417, 426 to 436, 439, 440, 442, 480 to 482, 493 and 499 and every person other than a person riding a bicycle who contravenes section 477 is guilty of an offence and is liable to a fine of $30 to $60.

509. Every person who contravenes any of sections 320, 322, 326, 331, 335, 365, paragraph 7.1 of section 386, section 388 or section 391, the first paragraph of section 407, any of sections 415, 416, 417.1, 418, 421.1, 473.1, 483 and 502, and every person other than a person riding a bicycle who contravenes any of sections 349,350, 359, 360, 362 to 364, 367, to 371, 404, 405, 408 to 411, 421, 478 and 479 is guilty of an offence and is liable to a fine of $100 to $200.

Level crossing

519.13. A driver of a heavy vehicle must, unless exempted from doing so by regulation or by a sign or signal, stop the heavy vehicle at least five metres from any level crossing and then proceed only after ascertaining that it is safe to proceed.

Exceptions

The Minister of Transport may, by order published in the *Gazette officielle du Québec*, designate certain level crossings at which the driver of a heavy vehicle is not required to stop.

1987, c. 94, s. 70; 1990, c. 83, s. 200; 1998, c. 40, s. 119.

Regulations

621. The Government may by regulation

(42.1) exempt certain heavy vehicles from the obligation of stopping at a level crossing;

New Brunswick
Motor Vehicle Act, R.S.N.B. 1986, c. M-17

182(1) Any person driving a vehicle approaching a railroad grade crossing shall stop such vehicle within fifteen metres, but not less than five metres from the nearest rail of such railroad, when

> (a) a clearly visible electric or mechanical signal device, designed to give warning of the approach of a railroad train, is exhibiting a warning signal,
>
> (b) a crossing gate is lowered or when a human flagman gives or continues to give a signal of the approach of a railroad train,
>
> (c) a railroad train approaching within approximately five hundred metres of the highway crossing emits a signal audible from such distance and such railroad train, by reason of its speed or nearness to such crossing, is an immediate hazard, or

(d) an approaching railroad train is plainly visible and is in hazardous proximity to such crossing

and shall not thereafter cross over the railroad track or tracks until the imminent danger from traffic on the railroad has ceased to exist.

182(2) No person shall drive any vehicle through, around, or under any crossing gate or barrier at a railroad crossing while such gate or barrier is closed or is being opened or closed. 1955, c.13, s.165; 1961-62, c.62, s.61; 1977, c.M-11.1, s.17(q)(r).

183(1) The following may cause stop signs to be erected at railway crossings:

(a) local authorities, within their jurisdictions;

(b) the New Brunswick Highway Corporation, with respect to railway crossings at highways under its administration and control; and

(c) the Minister, with respect to railway crossings at all other highways, including, without limiting the generality of the foregoing, those under the administration and control of a project company.

183(2) No such stop sign shall be erected by a local authority without the approval of the Lieutenant-Governor in Council.

183(3) The driver of a vehicle that is approaching a railway crossing at which a stop sign has been erected shall stop the vehicle within fifteen metres, but not less than five metres, from the nearest rail of the railway and shall not proceed until it is safe to do so. 1955, c.13, s.166; 1961-62, c.62, s.62; 1977, c.M-11.1, s.17; 1978, c.D-11.2, s.26; 1994, c.31, s.14; 1995, c.N-5.11, s.44; 1997, c.62, s.10.

184(1) The driver of any motor vehicle carrying passengers for hire, or of any bus, or of any vehicle carrying explosive substances or flammable liquids as a cargo or part of a cargo, before crossing at grade any tracks of a railroad, shall stop such vehicle within fifteen metres, but not less than five metres from the nearest rail of such railroad and while so stopped shall listen and look in both directions along such tracks for any approaching train, and for signals indicating the approach of a train, and shall not proceed until he can do so safely.

184(2) After stopping as required by subsection (1), and upon proceeding when it is safe to do so, the driver of any such vehicle shall cross with the vehicle so geared that there will be no necessity for changing gears while traversing such crossing and the driver shall not shift gears while crossing the track or tracks.

184(3) No stop need be made at any such crossing where a police officer or a traffic control signal directs traffic to proceed. 1955, c.13, s.167; 1977, c.M-11.1, s.17(t); 1983, c.52, s.13.

185(1) No person shall operate or move any crawler-type tractor, steam shovel, derrick, roller, or any equipment or structure having a normal operating speed of twenty or less kilometres per hour or a vertical body or load clearance of less than four centimetres for each metre of the distance between any two adjacent axles or in any event of less than twenty centimetres measured above the level surface of a roadway, upon or across any tracks at a railroad grade crossing without first complying with this section.

185(2) Notice of any such intended crossing shall be given to the railway agent of such railroad and a reasonable time shall be given to such railroad to provide proper protection at such crossing.

185(3) Before making any such crossing the person operating or moving any such vehicle or equipment shall first stop the same not less than five metres nor more than fifteen metres from the nearest rail of such railroad and while so stopped shall listen and look in both directions along such track for any approaching train and for signals indicating the approach of a train, and shall not proceed until the crossing can be made safely.

185(4) No such crossing shall be made when warning is given by automatic signal or crossing gates or a flagman or otherwise of the immediate approach of a railroad train or car, and if a flagman is provided by the railroad, movement over the crossing shall be under his direction. 1955, c.13, s.168; 1977, c.M-11.1, s.17(u).

Nova Scotia

Motor Vehicle Act, R.S.N.S. 1989, c. 293

amended 1990, c. 36; 1993, cc. 30, 31; 1994, cc. 25, 24; 1994-95, c. 6, s. 65; 1994-95, c. 12; 1995-96, cc. 20, 22, 23; 1996, cc. 34, 35; 1997, c. 5

Offence not to stop at railway crossing

132 (1) Whenever a person driving a vehicle approaches a highway and railway grade crossing and a clearly visible or positive signal gives warning of the immediate approach of a railway engine, train or car, it shall be an offence for the driver of the vehicle to fail to stop the vehicle before traversing such grade crossing.

Condition for entry of crossing

(2) No driver shall enter a highway and railway grade crossing unless there is sufficient space on the other side to accommodate the vehicle he is operating without obstructing the passage of railroad trains. R.S., c. 293, s. 132.

Offence to stop or park

143 It shall be an offence for the driver of a vehicle to stop, stand or park the vehicle, whether attended or unattended, except when necessary to avoid conflict with other traffic or in compliance with the directions of a peace officer or traffic control signal or sign, in any of the following places:

(m) within 15 metres of the nearest rail of a railway crossing;

Offence and minimum penalty of $15

292 Any person who violates any of the provisions of Section 18, 24, 28, 30, 34, 58 or 61, subsection (3) of Section 71, subsection (2) of Section 78, Section 95, 99, 126, 138, 139, 140, 143, 144, 146, 148, 149, 151, 155 or 156, subsection (1) of Section 158, or Section 159, 160, 166, 177, 179, 183, 187 or 202 shall be guilty of an offence and shall be liable for the first offence to a penalty of not less than fifteen dollars and in default of payment, to imprisonment for a term not less than seven days, for the second offence to a penalty of not less than twenty-five dollars and in default of payment, to imprisonment for a term not less than seven days, and for the third or any subsequent offence to a penalty of not less than fifty dollars and in default of payment to imprisonment for a term not less than seven days. R.S., c. 293, s. 292.

Offence and minimum penalty of $25

293 (1) Any person who violates any of the provisions of Section 38, 40, 65, 69, 70, 70A, 70B, 76 or 82, subsection (2) of Section 83, Section 93, 108, 113, 118, 119, 120, 122, 123, 124, 131, 132, 133, 134, subsection (1) of Section 136, 161, 162, 165, 169, 170, 174, 178, 181, 184, 185, 186, 189, 198, 201 or 301 shall be guilty of an offence and shall be liable for the first offence to a penalty of not less than twenty-five dollars and in default of payment, to imprisonment for a term not less than seven days, for the second offence to a penalty of not less than fifty dollars, and in default of payment, to imprisonment for a term not less than fourteen days, and for the third or subsequent offence to a penalty of not less than one hundred dollars or in default of payment, to imprisonment for a term not less than thirty days.

Canada
Railway Safety Act, R.S.C. 1985, c. 32 (4th Supp.)

OPERATION AND MAINTENANCE OF RAILWAY WORKS AND EQUIPMENT

Regulations

18. (1) The Governor in Council may make regulations

(a) respecting the operation or maintenance of line works, and the design, construction, alteration, operation and maintenance of railway equipment, which regulations may embrace, among other things, performance standards;

(b) declaring positions in railway companies to be critical to safe railway operations;

(c) respecting the following matters, in so far as they relate to safe railway operations, in relation to persons employed in positions referred to in paragraph (b):

(i) the training of those persons, both before and after appointment to those positions,

(ii) hours of work and rest periods to be observed by those persons,

(iii) minimum medical, including audiometric and optometric, standards to be met by those persons,

(iv) the control or prohibition of the consumption of alcoholic beverages and the use of drugs by those persons, and

(v) the establishment of support programs for those persons and standards applicable to such programs; and

(d) respecting the establishment of a scheme for licensing persons employed in positions referred to in paragraph (b), and prescribing the fees for the licences.

Regulations - crossing works

(2) The Governor in Council may make regulations respecting crossing works, including regulations for requiring a railway company, road authority or other person who has rights relating to a road crossing to conduct a safety review of the road crossing following an accident of a type specified in the regulations.

Regulations - security

(2.1) The Governor in Council may make regulations respecting the security of railway transportation.

Regulations to override rules

(3) If the Governor in Council at any time makes regulations respecting a matter referred to in subsection (1) or (2.1) that are inconsistent with rules approved in relation to a particular company by the Minister under section 19 or 20 in respect of that matter, those rules are at that time revoked to the extent of the inconsistency.

R.S., 1985, c. 32 (4th supp), s. 18; 1999, c. 9, s. 12

Rules

Formulation or revision of rules pursuant to ministerial order

19. (1) The Minister may, by order, require a railway company

(a) to formulate rules respecting any matter referred to in subsection 18(1) or (2.1) or to revise its rules respecting that matter; and

(b) within a specified period, to file the formulated or revised rules with the Minister for approval.

Railway company to consult

(2) A railway company shall not file rules with the Minister under subsection (1) unless it has first given each relevant association or organization that is likely to be affected by their implementation a reasonable opportunity during a period of sixty days to consult with it on the rules.

Notice to accompany rules

(3) Where rules are filed with the Minister by a railway company pursuant to an order under subsection (1) notwithstanding that a relevant association or organization objects, on the grounds of safety, to the implementation of those rules, the railway company shall, by notice filed with those rules, identify the association or organization and attach a copy of the notice of objection.

Consideration of rules

(4) Where rules are filed with the Minister by a railway company pursuant to an order under subsection (1), the Minister shall forthwith consider whether, in the Minister's opinion and after having regard to current railway practice, to the views of the railway

company and the views of any relevant association or organization identified under subsection (3) and to any other factor that the Minister considers relevant, those rules are conducive to safe railway operations by the company, and, before the expiration of the assessment period in relation to those rules,

(a) if the Minister is satisfied that the rules are conducive to those operations, notify the company and each association or organization identified under subsection (3) that the Minister approves those rules, either absolutely or on such terms and conditions as are specified in the notice; or

(b) if the Minister is not satisfied that the rules are conducive to those operations, notify the company and each association or organization identified under subsection (3) that the Minister refuses to approve those rules and of the reasons why the Minister is not so satisfied.

Request for amendment to terms and conditions

(4.1) A railway company referred to in subsection (4) may request the Minister to amend any terms or conditions specified under that subsection. When making that request, the company shall send a copy of the request to each relevant association or organization.

Amendments

(4.2) After receiving a request from a railway company under subsection (4.1), the Minister may, on the basis of new information about the safety of the railway operations, amend any terms or conditions specified under subsection (4). If the Minister amends any of those terms or conditions, the Minister shall provide each relevant association or organization with a copy of the amendments.

Minister may seek advice

(5) The Minister may, in deciding whether to approve rules filed by a railway company, engage any person or organization having expertise in matters relating to safe railway operations to furnish advice in relation to the matter.

Effective date of rules

(5.1) Rules approved by the Minister under subsection (4) come into force on a day specified by the Minister, but if they replace any regulations, they may not come into force earlier than the day on which the regulations are repealed.

Revision of rules

(6) Where a railway company files rules in respect of a matter pursuant to an order under subsection (1) and the Minister notifies the company that the Minister refuses to approve those rules,

(a) the company may, unless the Minister indicates in that notice an intention to establish rules in respect of that matter under subsection (7), formulate and file with the Minister for approval further rules in respect of that matter as if the order made pursuant to subsection (1) in respect of that matter had been made on the date of receipt by the company of the notice of refusal; and

(b) the provisions of this section apply in relation to those further rules, with such modifications as the circumstances require.

Failure to file rules

(7) Where

(a) a railway company fails to file rules pursuant to an order under subsection (1), or

(b) a railway company files rules pursuant to an order under subsection (1) but the Minister refuses under subsection (4) to approve those rules,

the Minister may, by order, establish rules in respect of the matter in relation to that company.

Consultation

(8) The Minister shall not, under this section, establish rules applying to a particular railway company unless the Minister has

(a) given that company and each relevant association or organization a reasonable opportunity during a period of sixty days to consult with the Minister on the rules; and

(b) considered any objection, on the grounds of safety, to the establishment of the rules that is made in the course of that consultation.

Rules established by Minister

(9) Rules established by the Minister under subsection (7) in relation to a railway company have the same effect as if they had been formulated by the company and approved by the Minister under subsection (4).

Definition of "assessment period"

(10) In this section, "assessment period", in relation to rules filed with the Minister under this section, means

(a) the period of sixty days commencing on the day on which the rules are filed; or

(b) if, before the expiration of the period mentioned in paragraph (a), the Minister determines that, by reason of the complexity of the rules, the number of rules filed or any other reason, it will not be feasible to consider the rules before the expiration of that period, and so notifies the railway company concerned, such period in excess of that period of sixty days as the Minister specifies in the notice.

Period of inquiry not part of assessment period

(11) Where, pursuant to section 40, the Minister directs persons to conduct an inquiry respecting proposed rules, the period commencing on the day when the Minister so directs and ending on the day when the persons report back to the Minister pursuant to section 40 shall be disregarded in computing the assessment period.

R.S., 1985, c. 32 (4th Supp.), s. 19; 1999, c. 9, s. 13.

Formulation or revision of rules

20. (1) A railway company shall file with the Minister for approval any rules in respect of any matter referred to in subsection 18(1) or (2.1) that it proposes to formulate or revise on its own initiative.

Consultation

(2) A railway company shall not file rules with the Minister under subsection (1) unless it has first given each relevant association or organization that is likely to be affected by their implementation a reasonable opportunity during a period of sixty days to consult with it concerning the rules.

Rules to be accompanied by notice

(3) Rules filed with the Minister by a railway company pursuant to subsection (1) shall be accompanied by a notice

(a) setting out the reasons why the railway company proposes to formulate or revise the rules; and

(b) if a relevant association or organization objects, on the grounds of safety, to the implementation of those rules, identifying the association or organization and attaching a copy of the notice of objection.

Application of certain provisions

(4) Subsections 19(4) to (5.1), (10) and (11) apply in relation to the filing and consideration of rules filed with the Minister under subsection (1) as if the rules had been duly filed in compliance with an order made under subsection 19(1).

R.S., 1985, c. 32 (4th Supp.), s. 20; 1999, c. 9, s. 14.

Miscellaneous Provisions Relating to Regulations and Rules under this Part

Uniformity of rules

21. In establishing, under section 19 or 20, rules applying to a particular railway company or in deciding, under section 19 or 20, whether to approve rules formulated or revised by, and applying to, a particular railway company, the Minister shall, to the extent that it is, in the opinion of the Minister, reasonable and practicable to do so, ensure that those rules are uniform with rules dealing with a like matter and applying to other railway companies.

Exemption by order in council

22. (1) The Governor in Council may, by order, on any terms and conditions that are specified in the order,

(a) exempt a specified railway company, specified railway equipment or a specified railway work from the application of a specified provision of regulations made under subsection 18(1) or (2.1) or of rules in force under section 19 or 20; or

(b) exempt a specified person from the application of a specified provision of regulations made under subsection 18(2).

Exemption by Minister

(2) The Minister may, by notice, on any terms and conditions that are specified in the notice,

(a) exempt a specified railway company, specified railway equipment or a specified railway work from the application of a specified provision of regulations made under subsection 18(1) or (2.1) or of rules in force under section 19 or 20, or

(b) exempt a specified person from the application of a specified provision of regulations made under subsection 18(2)

if, in the opinion of the Minister, the exemption is in the public interest and is not likely to threaten safe railway operations.

Sending of notices

(3) A notice under subsection (2) shall be sent to the railway company or person exempted by the notice and takes effect on receipt by that company or person.

Application

(4) A railway company may apply to the Minister for an exemption from the application of a specified provision of regulations under subsection 18(1), (2) or (2.1) or of rules in force under section 19 or 20.

Railway company to consult

(5) A railway company may not apply for an exemption under subsection (4) unless it has first given each relevant association or organization that is likely to be affected by the exemption a reasonable opportunity during a period of sixty days to consult with it, except that it may apply for the exemption before the end of those sixty days if it has consulted with all those associations and organizations.

Copy of comments

(6) The railway company shall send with its application to the Minister a copy of all comments received from relevant associations and organizations.

Period for granting application

(7) The Minister may grant the application within sixty days after receiving it if, in the opinion of the Minister, the exemption is in the public interest and is not likely to threaten safe railway operations. The Minister may extend the time for granting the application for an additional period of up to sixty days.

R.S., 1985, c. 32 (4th Supp.), s. 22; 1999, c. 9, s. 15.

Other exemptions

22.1 (1) A railway company that proposes to conduct testing relating to rail transportation, or that requires an immediate exemption of short duration, is exempt from the application of any provision of standards formulated under section 7, regulations made under subsection 18(1) or (2) or 24(1) or rules in force under section 19 or 20 during any period that the company considers necessary. However, the exemption is effective only if the railway company files a notice of the exemption with the Minister and each relevant association or organization that is likely to be affected by the exemption and

(a) within twenty-one days after filing the notice, the company receives a response from the Minister and each of those associations and organizations indicating that they do not object to the exemption; or

(b) no objections are confirmed or made by the Minister under subsection (3).

Objections

(2) Each of the relevant associations or organizations may object to the exemption on the grounds of safety. The objection must be filed with the Minister and the railway company within fourteen days after the notice referred to in subsection (1) is filed.

Minister's decision

(3) The Minister may

(a) within seven days after the filing of an objection under subsection (2), confirm the objection if the Minister decides that the exemption threatens safety; or

(b) within twenty-one days after receiving the notice under subsection (1), object to the exemption if the Minister is of the opinion that the exemption is not in the public interest or that it is likely to threaten safety.

1999, c. 9, s. 16.

Operation and Maintenance of Railway Works to Accord with Regulations and Rules

Company not to operate or maintain a railway otherwise than in accordance with regulations or rules

23. (1) Unless a railway company is exempted under section 22 or 22.1 from the application of regulations made under section 18 or of rules in force under section 19 or 20 that would otherwise apply to that company, the company shall not operate or maintain railway works or railway equipment otherwise than in accordance with those regulations or rules.

Person not to maintain crossing work other than in accordance with regulations

(2) Unless the person responsible for the maintenance of a crossing work is exempted under section 22 or 22.1 from the application of regulations made under section 18 in relation to the maintenance of that crossing work, that person shall not maintain that crossing work otherwise than in accordance with those regulations.

R.S., 1985, c. 32 (4th Supp.), s. 23; 1999, c. 9, s. 17.

Audible Warnings

Use of whistles

23.1 (1) No person shall use the whistle on any railway equipment in an area within a municipality if

(a) the area meets the requirements prescribed for the purposes of this section; and

(b) the government of the municipality by resolution declares that it agrees that such whistles should not be used in that area and has, before passing the resolution,

(i) consulted the railway company that operates the relevant line of railway,

(ii) notified each relevant association or organization, and

(iii) given public notice of its intention to pass the resolution.

Ministerial decision

(2) The Minister may decide whether the area meets the prescribed requirements and the Minister's decision is final.

Exceptions

(3) Despite subsection (1), the whistle may be used if

(a) there is an emergency;

(b) any rules in force under section 19 or 20 require its use; or

(c) a railway safety inspector orders its use under section 31.

1999, c. 9, s. 18.

PART III

NON-RAILWAY OPERATIONS AFFECTING RAILWAY SAFETY

Regulations

24. (1) The Governor in Council may make regulations

(a) respecting

(i) the control or prohibition of the construction or alteration, or

(ii) the control of the maintenance

of buildings and other structures, not being railway works, erected or proposed to be erected above or below a line of railway, or on land adjoining the land on which the line is situated, to the extent only that is necessary to prevent those buildings or structures from constituting a threat to safe railway operations;

(b) respecting the control or prohibition of the construction, alteration or operation of any mine or other works, not being railway works, constructed or proposed to be constructed below or on land adjoining the land on which a line of railway is situated, to the extent only that is necessary to prevent those mines or works from constituting a threat to safe railway operations;

(c) respecting

(i) the control or prohibition of the construction or alteration, and

(ii) the control of the maintenance,

on land adjoining the land on which a line of railway is situated, of drainage systems that would constitute a threat to safe railway operations;

(d) respecting the control or prohibition of the presence or storage, on land adjoining the land on which a line of railway is situated, of specified materials;

(e) respecting

(i) the removal of anything, including trees or brush, that might, by obscuring clear vision either of a road or of a line of railway, constitute a threat to safe railway operations,

(ii) the removal of weeds that are on or along lines of railway, and

(iii) the use of alternatives to chemical pesticides under subparagraphs (i) and (ii);

(f) for restricting or preventing, by means of fences, signs or any other means, access to the land on which a line of railway is situated by persons, other than servants or agents of the railway company concerned, by vehicles, or by animals, where the presence of persons, vehicles or animals on that land would constitute a threat to safe railway operations;

(f.1) respecting the construction, alteration and maintenance of roads for the purpose of ensuring safe railway operations;

(f.2) respecting the control of vehicular and pedestrian traffic on road approaches to road crossings for the purpose of ensuring safe railway operations; and

(g) respecting the control or prohibition of any other activity, on land adjoining the land on which a line of railway is situated, that could constitute a threat to safe railway operations.

Exemption by Minister

(1.1) The Minister may, on any terms and conditions that the Minister considers necessary, exempt any railway company or other person from the application of any regulation made under subsection (1) if, in the opinion of the Minister, the exemption is in the public interest and is not likely to threaten safety.

Compensation

(2) Where the owner, lessee or occupier of land adjoining the land on which a line of railway is situated, the owner, lessee or occupier of any building or other structure erected on that adjoining land, or the owner of any mine or other works operated on that adjoining land, suffers a loss by reason of the operation of the regulations made under this section, the railway company operating that line of railway shall pay to that person such compensation in respect of that loss as is agreed to between the railway company and that person or, failing such agreement, as is determined pursuant to section 26.

R.S., 1985, c. 32 (4th Supp.), s. 24; 1994, c. 15, s. 1(F); 1999, c. 9, s. 19.

Offences

Contravention of provision of Act

41. (1) Every person who contravenes a provision of this Act is guilty of an offence and liable

(a) on conviction on indictment,

(i) in the case of a corporation, to a fine not exceeding two hundred thousand dollars, and

(ii) in the case of an individual, to a fine not exceeding ten thousand dollars or to imprisonment for a term not exceeding one year, or to both; or

(b) on summary conviction,

(i) in the case of a corporation, to a fine not exceeding one hundred thousand dollars, and

(ii) in the case of an individual, to a fine not exceeding five thousand dollars or to imprisonment for a term not exceeding six months, or to both.

Contravention of regulations, orders, etc.

(2) A person is guilty of an offence if the person contravenes

(a) a regulation made under subsection 7(1) or section 7.1, 18, 24, 37, 47 or 47.1;

(b) an order made by the Minister or a railway safety inspector under subsection 7(2) or 19(1) or section 31 or 32;

(c) a requirement made by the Agency under subsection 16(3) or 26(3);

(d) a rule in force under section 19 or 20;

(e) an emergency directive made by the Minister under section 33; or

(f) a requirement under subsection 39.1(2) to carry out a security measure.

Punishment

(2.1) A person who is guilty of an offence under subsection (2) is liable on summary conviction

(a) in the case of a corporation, to a fine of not more than $100,000; and

(b) in the case of an individual, to a fine of not more than $5,000 or to imprisonment for a term of not more than six months, or to both.

Continuing offences

(3) If a person commits a contravention described in subsection (1) or (2) that occurs on more than one day, or is continued for more than one day, the person is deemed to have committed a separate offence for each day on which it occurs or is continued.

Contraventions Regulations
Contraventions Regulations, S.O.R./96 – 313.

P.C. 1996-915 20 June, 1996

SCHEDULE I.01 (Sections 1 to 3)

PART I

CANADA PORTS CORPORATION OPERATING BY-LAW

Item	Provision of *Canada Ports Corporation Operating By-law*	Short-Form Description	Fine ($)
22.	42(b)	Operate vehicle between railway tracks	50
23.	42(c)	Operate vehicle across railway tracks	50

SOR/97-469, s. 2; SOR/2000-381, s. 1.

SCHEDULE X

(Sections 1 to 3)

RAILWAY SAFETY ACT

Item	Provision of R.S.A.	Short-Form Description	Fine ($)
1.	26.1	Enter on land on which a line work is situated	100

SOR/98-253, s. 1.

APPENDIX B

MOTOR CARRIER SAFETY ASSESSMENT THRESHOLD FORMULA

THE EXAMPLE OF ONTARIO AND ITS COMMERCIAL VEHICLE OPERATOR'S REGISTRATION (CVOR) SYSTEM

ACCIDENT THRESHOLD

An accident threshold value is determined for each carrier, based on its adjusted fleet size. Carriers with the same adjusted fleet size will therefore have the same accident threshold. The accident violation rates of a large sample of carriers were analysed and a threshold curve was established that identifies those carriers with unacceptably high accident rates relative to other carriers of similar fleet size.

The accident threshold formula is:

	for Fleet Size 1-25	**for Fleet Size 26+**
Accident Threshold	$T_a = 0.2226 f^{-0.5000}$	$T_a = 0.0436$

Where: T_a = accident points / vehicle / month
f = adjusted fleet size

For ease of calculation, accident threshold values have been calculated and presented in a "look-up" table contained in *Ontario's Carrier Safety Rating and Commercial Vehicle Operator's Registration System – Public Guideline, 2000* published by the Ontario Ministry of Transportation.

CONVICTION THRESHOLD

A conviction threshold value is determined for each carrier, based on its adjusted fleet size. Carriers with the same adjusted fleet size will therefore have the same conviction threshold. The conviction violation rates of a large sample of carriers were analysed and a threshold curve was established that identifies those carriers with unacceptably high conviction rates relative to other carriers of similar fleet size.

The conviction threshold formula is:

	for Fleet Size 1-25	**for Fleet Size 26+**
Conviction Threshold	$T_c = 1.0452 f^{-0.5663}$	$T_c = 0.1652$

Where: T_c = conviction points / vehicle / month
f = adjusted fleet size

For ease of calculation, conviction threshold values have been calculated and presented in a Table format contained in *Ontario's Carrier Safety Rating and Commercial Vehicle Operator's Registration System – Public Guideline, 2000* published by the Ontario Ministry of Transportation.

INSPECTION THRESHOLD

An inspection threshold value is determined for each carrier, based on its frequency of vehicle inspections. Carriers with the same number of vehicle units inspected will therefore have the same inspection threshold. The inspection violation rates of a large sample of carriers were analysed and a threshold curve was established that identifies those carriers with unacceptably high CVSA inspection "out-of-service" rates relative to other carriers with a similar number of vehicle units inspected.

The inspection threshold formula is (for both small and large carriers):

Inspection Threshold $T_i = 5.3841\ v^{-0.4350}$

Where:
T_i = inspection points / # of vehicle units inspected
v = # of vehicle units inspected in the analysis period

CVOR Calculations

How is the adjusted fleet size calculated?

The following three steps are used to establish the adjusted fleet size of a carrier that is used to determine the carrier's accident and conviction violation rates and thresholds. This calculation incorporates the percentage of travel in Ontario and double-shifting.

1. To calculate the total number of commercial motor vehicles operated in Ontario (include only those vehicles operated in Ontario):
   Vehicle power units owned *plus*
   Vehicle power units leased/rented *plus*
   Owner/Operators under CVOR *plus*
   Number of those commercial motor vehicles double-shifted *equals*
   Total vehicles operated in Ontario.

   For example:

   Bob owns 10 highway tractors and leases 5 trucks. He also employs 5 Owner/Operators. The tractors (10) are driven by teams and are therefore double-shifted.

   Therefore, Bob's total number of commercial motor vehicles is:

   10 + 5 + 5 + 10 = 30 total commercial motor vehicles.

2. To calculate the percentage of travel in Ontario:
   Total kilometres travelled in Ontario by those vehicles operating in Ontario *divided by*
   Total kilometres travelled by those vehicles operating in Ontario *multiplied by* 100 *equals*
   Percentage of travel in Ontario.

   For example:

   Bob's fleet travels approximately 500,000 km per year, of which 400,000 are within Ontario.

Therefore, Bob's percentage of travel is:

(400,000 ÷ 500,000) x 100 = 80% travel in Ontario.

3. To calculate the adjusted fleet size:
Total commercial motor vehicles operated in Ontario *multiplied by*
Percentage of travel in Ontario *equals*
Adjusted fleet size (rounded up).

For example:

Bob's total number of commercial motor vehicles operated in Ontario is 30 and the percentage of travel of these vehicles in Ontario is 80%.

Therefore, Bob's adjusted fleet size is:

30 x 80% = 24.

How are the Accident Violation Rate and Percentage of Threshold calculated?

Using the data collected from police accident reports, accident demerit points are assigned according to the accident weighting table.

An accident is considered to have impropriety if the accident report indicates something other than "normal" under vehicle condition (fields 31and 32), driver action (fields 33 and 34) or driver condition (fields 35 and 36). See the Motor Vehicle Accident Report and Template in *Ontario's Carrier Safety Rating and Commercial Vehicle Operator's Registration System – Public Guideline, 2000* published by the Ontario Ministry of Transportation for more details.

For example:

A carrier with an adjusted fleet size of 2 vehicles had the following 3 accidents in the past 24-month period *(note: the 24-month period does not include the most recent 30 days)*:

- 1 involving property damage and no impropriety (0 points);
- 1 involving personal injury and impropriety/charges (8 points);
- 1 involving a fatality and no impropriety (0 points).

The Accident Violation Rate would be calculated in the following manner:

Step 1

Calculate the total accident points:

0 + 8 + 0 = 8 (total accident points).

Step 2

Divide the total accident points by the number of vehicles operated:

8 ÷ 2 = 4 (total points per vehicle).

Step 3

Divide the number of points per vehicle by the number of months operated:

4 ÷ 24 = 0.1667 (points per vehicle per month).

Step 4

Consult the Table of Threshold Values in *Ontario's Carrier Safety Rating and Commercial Vehicle Operator's Registration System – Public Guideline, 2000* published by the Ontario Ministry of Transportation to determine the accident threshold for a carrier with a fleet size of 2. The accident threshold value for an adjusted fleet size of 2 is 0.1574.

Step 5

Calculate the percentage of threshold by dividing the points per vehicle per month by the accident threshold value in the table and multiplying the result by 100:

(0.1667 ÷ 0.1574) x 100 = 105.9% (% of accident threshold = P_a).

In other words, this carrier's accident violation rate is 5.9% above the accident threshold for a carrier with an adjusted fleet size of 2 vehicles.

How are the Conviction Violation Rate and Percentage of Threshold calculated?

The CVOR system assigns points to safety related convictions as indicated in the Conviction Code Table.

For example:

The same carrier described previously with an adjusted fleet size of 2 vehicles also had the following 4 convictions in the past 24-month period *(note: the 24-month period does not include the most recent 30 days)*:

- Failure to make daily log (6 points);
- Overweight - dual axle over 2000 kg (2 points);
- Failure to display plates while driving motor vehicle - (0 points);
- Failure to inspect/repair/maintain according to standard (6 points).

The Conviction Violation Rate would be calculated in the following manner:

Step 1

Calculate the total conviction points:

6 + 2 + 0 + 6 = 14 (total conviction points).

Step 2

Divide the total conviction points by the number of vehicles operated:

14 ÷ 2 = 7 (total points per vehicle).

Step 3

Divide the number of points per vehicle by the number of months operated:

7 ÷ 24 = 0.2916 (points per vehicle per month).

Step 4

Consult the Table of Threshold Values in *Ontario's Carrier Safety Rating and Commercial Vehicle Operator's Registration System – Public Guideline, 2000* published by the Ontario Ministry of Transportation to determine the conviction threshold for a carrier with an adjusted fleet size of 2. The conviction threshold value for an adjusted fleet size of 2 is 0.7059.

Step 5

Calculate the percentage of threshold by dividing the points per vehicle per month by the conviction threshold value in the table and multiplying the result by 100:

(0.2916 ÷ 0.7059) x 100 = 41.3% (% of conviction threshold = P_c).

In other words, this carrier's conviction violation rate is at 41.3% of the conviction threshold established for a carrier with an adjusted fleet size of 2 vehicles.

How are the Inspection Violation Rate and Percentage of Threshold calculated?

The CVOR system assigns points to Commercial Vehicle Safety Alliance (CVSA) out-of-service (oos) vehicle defects. This calculation is performed on the number of vehicle units inspected as opposed to the adjusted fleet size used to calculate the accident and conviction violation rates.

Two calculations are performed to derive the inspection threshold.

For example:

The same carrier as before with an adjusted fleet size of 2 vehicles had the following 3 inspections in the past 24-month period *(note: the 24-month period does not include the most recent 30 days)*:

Table 1
Out-of-Service Points Calculation Table
(1 point per defect)

	Power Unit	Trailer 1	Converter Dolly	Trailer 2	Total Points Assigned	# Vehicle units inspected
Inspection 1	1	0	0	1	2	4
Inspection 2	0	0	N/A	N/A	0	2
Inspection 3	3 (max. 2 pts.)	4 (max. 2 pts.)	0	2	6	4
				Total	8	10

Calculation 1

Calculate the total inspection points:

- Remember, each oos defect is assigned 1 point, but the maximum number of points assigned for each vehicle unit inspected is 2.
- Remember, a minimum of 2 inspections are required to calculate the Inspection Violation Rate.

2 + 0 + 6 = 8 (total inspection points where 1 oos defect = 1 point).

Calculation 2

Step 1

Determine the total number of inspections in which at least one oos defect was discovered. In this carrier's case, 2 inspections had oos defects (inspections 1 and 3).

Step 2

Determine the total number of inspections conducted in the previous 24-month period *(note: the 24-month period does not include the most recent 30 days)*. In this case, the carrier had 3 inspections.

Step 3

Divide the total number of inspections with oos defects by the total number of inspections conducted and multiply by 100:

(2 ÷ 3) x 100 = 66.7% (oos rate).

Step 4

Locate the out-of-service rate standard as indicated on the second page of the Carrier CVOR Abstract (Level II). In this case, the standard is 35.3%.

Step 5

Count 1 point for every full 10% the oos rate in Step 3 exceeds the current out-of-service rate standard (Step 4):

66.7% - 35.3% = 31.4% = 3 points (1 point for each full 10%)

Step 6

Add the points calculated in Calculation 1 to the value calculated in Step 5 and divide by the number of vehicle units inspected as found in Table 1:

8 + 3 = 11 points (from 10 vehicle units inspected)

11 ÷ 10 = 1.1000 points per vehicle unit inspected.

Consult the Table of Threshold Values in *Ontario's Carrier Safety Rating and Commercial Vehicle Operator's Registration System – Public Guideline, 2000* published by the Ontario Ministry of Transportation to determine the inspection threshold for a carrier with 10 vehicle units inspected (1.9775).

Step 7

Calculate the percentage of threshold by dividing the points per vehicle units inspected by the inspection threshold value in the table and multiplying the result by 100:

(1.1000 ÷ 1.9775) x 100 = 55.6% (% of inspection threshold = P_i).

In other words, this carrier's inspection violation rate is at 55.6% of the inspection threshold established for a carrier with 10 vehicle units inspected.

How does the CVOR system calculate a carrier's overall performance?

The carrier's overall performance is determined by combining its accident, conviction and inspection performance values in the proportions of 2 to 1 to 1.

The overall performance measure formula is:

$P_o = (2P_a + P_c + P_i) / 4$

Where: P_o = Overall Performance
P_a = Accident Performance
P_c = Conviction Performance
P_i = Inspection Performance

When a carrier's overall violation rate exceeds 1 (100%), it is said to be "over threshold" and may be subject to sanctioning by the Registrar of Motor Vehicles.

Remember that the Overall Percent of Threshold calculation weights accidents at double the severity of convictions and inspections (2:1:1 ratio).

Step 1

Multiply the Percent of Accident Threshold (105.9%) by 2, then add the Percent of Conviction Threshold (41.3%) and Percent of Inspection Threshold (55.6%):

2(105.9%) + 41.3% + 55.6% = 308.7%.

Step 2

Divide the value in Step 1 by 4:

308.7% ÷ 4 = 77.2% (Percent of Overall Threshold).

This value represents the carrier's overall violation rate as a percentage of its overall threshold.

How is the overall violation rate calculated as a percentage of the overall threshold when a carrier's fleet size has changed?

When a carrier's fleet size has changed within a two-year period, the Ministry assigns a violation rate for each fleet size period and averages the violation rate over the full two-year period. This averaging of fleet size more accurately determines a carrier's overall violation rate as a percentage of overall threshold.

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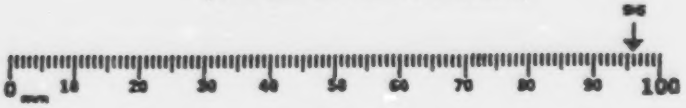

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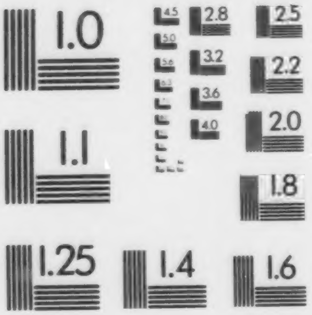

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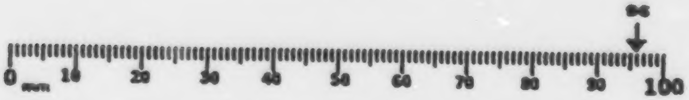

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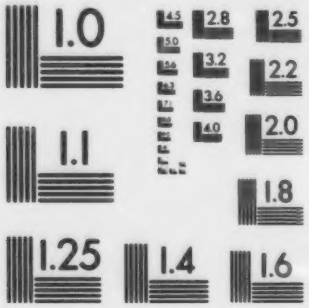

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GRADE CROSSING CONTRAVENTIONS AND MOTOR CARRIER SAFETY ASSESSMENT

Prepared for
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16. Abstract

This project is part of a larger R&D initiative launched by Transport Canada under Direction 2006. Under this federal initiative, launched in 1996, Transport Canada has an objective of reducing grade crossing occurrences and trespassing occurrences by 50 percent by 2006.

This report investigates infractions and occurrences at public grade crossings involving commercial vehicles as defined by the National Safety Code (i.e., vehicles over 4,500 kg). It provides a summary of existing statistical evidence on occurrences at grade crossings involving commercial vehicles and a description of the grade crossing infractions included under provincial highway traffic acts and regulations.

The report describes the procedures used by the provinces and territories to assess the safety performances of motor carriers and provides a description of the infractions included under the motor carrier and driver profiles. It also investigates the situation in the United States and identifies the level of awareness on the part of regulators and motor carriers regarding the issue of grade crossing contraventions and occurrences.

Based on the findings of the research, the report makes recommendations to enhance safety at grade crossings and national uniformity of treatment of the contraventions taking place at grade crossings.

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16. **Résumé**

Ce projet fait partie d'un vaste programme de R&D mis sur pied par Transports Canada dans le cadre de Direction 2006. Cette initiative fédérale, lancée par Transports Canada en 1996, vise à réduire de moitié les accidents qui surviennent aux passages à niveau et les cas d'intrusion sur les propriétés ferroviaires d'ici 2006.

Ce rapport porte sur les infractions et les accidents aux passages à niveau publics mettant en cause des véhicules commerciaux tels que définis par le Code national de sécurité (véhicules de plus de 4 500 kg). Il propose un résumé des données statistiques sur les accidents impliquant des véhicules commerciaux aux passages à niveau, ainsi qu'un inventaire des infractions aux passages à niveau prévues par les lois, règlements et codes de la route provinciaux.

Il discute des méthodes utilisées par les provinces et les territoires pour évaluer le rendement des transporteurs routiers sur le plan de la sécurité, et énumère les infractions prises en compte dans les profils des conducteurs et des transporteurs. Il examine en outre la situation aux États-Unis et mesure le degré de sensibilisation des organismes de réglementation et des transporteurs routiers à l'égard des infractions et des accidents aux passages à niveau.

S'appuyant sur les résultats de l'étude, les chercheurs formulent des recommandations pour améliorer la sécurité aux passages à niveau et pour rendre plus uniforme le traitement des infractions aux passages à niveau.

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This study is a part of the Highway-Railway Grade Crossing Research Program, an undertaking sponsored by Transport Canada, major Canadian railways, and several provincial authorities. The program is a component of Direction 2006, a cooperative initiative with the goal of halving grade crossing accidents by 2006.

EXECUTIVE SUMMARY

This research project is one of the projects supported by Rail Safety and the Transportation Development Centre under their R&D mandates and Direction 2006. It purports to address road safety-related behaviour and is especially aimed at commercial operators. This project goes beyond the traditional 3-E (Engineering - Education - Enforcement) approach traditionally used for grade crossing safety improvements. In a sense it could be classified as a "hybrid E", as it fits between Education and Enforcement.

This project deals with infractions and occurrences at public grade crossings involving commercial vehicles as defined by the National Safety Code (i.e., vehicles over 4,500 kg). This includes vehicle types ranging from cube vans delivering courier or consumer goods to tractor semi-trailers. It also includes passenger buses with a capacity to transport 10 passengers or more (including the driver). Commercial drivers are those drivers holding a Class 1, 2, 3, 4 or 5 licence as defined under the National Safety Code (NSC). It is understood that some provinces have variations on those standards.

The objectives of this project were as follows:

- Provide a summary of existing statistical evidence on occurrences at grade crossings involving commercial vehicles;
- Provide a description of the grade crossing infractions included under provincial highway traffic acts and regulations;
- Provide a description of the infractions included under the motor carrier and driver profiles;
- Provide a brief description on the situation in the United States;
- Identify the level of awareness on the part of regulators and motor carriers regarding this issue;
- Make recommendations to enhance safety and national uniformity of treatment.

A literature search conducted as part of this project did not identify any research on the relationship between grade crossing occurrences and motor carrier safety ratings. Nor did there seem to be any research on the treatment being given to such infractions as part of the assessment of the safety performance of motor carriers.

The statistical review performed as part of this project can be summarized as follows:

- In 2000, commercial vehicles were involved in 12.6 percent of the occurrences at public crossings across Canada for a total of 33 occurrences. This represented an increase over 1999, in which 25 occurrences were recorded. This represented, then, 8.8 percent of all occurrences at public crossings.
- Generally speaking, this number of occurrences is small when considered in the context of total involvement by commercial vehicles in all road accidents (less than 1 percent).
- The number of fatalities and serious injuries is also small when considered in the same context (i.e., 3 in 2000 and 1 in 1999).

- Grade crossing contraventions in Ontario represent a small percentage (0.02 percent) of the total number of contraventions in that province. Other provinces likely have similar experience, but no statistics could be obtained at this stage.
- 2000 marked an increase in the number of occurrences involving commercial vehicles at public grade crossings. Before that year, there had been a reduction in occurrences involving commercial vehicles at public grade crossings.
- Statistics, as currently gathered by the Transportation Safety Board of Canada, do not allow specific analysis of the occurrences in terms of characteristics of the commercial fleets and drivers involved.

The project looked at the legislative and regulatory framework and found that the framework exists for proper recognition of grade crossing contraventions at both the federal and provincial/territorial levels. Furthermore, with the implementation of NSC standard #14 in all provinces and territories, and with the amendments to the Motor Vehicle Transport Act, there will soon be a mechanism for treating those contraventions.

Motor carrier safety performance ratings are based on motor carrier violations with respect to reportable accidents, convictions, Commercial Vehicle Safety Alliance inspections, and results of facility audits. Procedures have also been developed to establish threshold levels for each category of motor carrier according to fleet size.

Reportable occurrences at grade crossings are included in the motor carrier safety rating. The definition of *reportable accident* may, however, vary from province to province and the number of demerit points assessed to an accident may also vary between provincial regimes.

The following table provides a list of grade crossing contraventions for which a ticket is issued or for which there has been a conviction, and the associated demerit points assessed to motor carriers and commercial drivers. The table includes only provinces with a motor carrier safety rating system in place and where grade crossings exist.

Demerit Points Assessed to Motor Carriers for Grade Crossing Contraventions

Demerit Points by Province(s)

Contraventions	**NB**	**QC**	**ON**	**Prairie Provinces***
Failing to stop before a grade crossing when indicated or hazardous	3			3
Driving vehicle through or around barrier at grade crossing	3		3	
Failing to stop at stop sign at grade crossing	3			
Failing to stop at grade crossing		3		
Failing to stop at grade crossing when transporting explosives, flammable materials, or paying passengers	3			
Changing gears while crossing railway tracks at grade crossing	3			
Changing gears while crossing railway tracks at grade crossing – school and passenger bus			5	
Crossing railway tracks at grade crossing using a gear that needs to be changed – school and passenger bus			5	
Crossing railway tracks improperly at grade crossing	3			
Failing to look both ways at grade crossing – school and passenger bus			5	
Failing to stop at grade crossing – school and passenger bus			5	
Failing to open door at grade crossing – school and passenger bus			5	
Failing to stop a commercial vehicle at least five metres from railway tracks at grade crossing		3	3	
Engaging a vehicle on railway tracks at grade crossing without allowing enough space for that vehicle		3		
Performing a U-turn on/near grade crossing			2	
Stopping in the wrong place at grade crossing – school and passenger bus			5	
Stopping in the wrong place at portable signal at grade crossing			2	3

*Prairie Provinces have agreed to use the CCMTA Conviction Equivalency Table.

A review of violations/contraventions by province revealed the following:

- Grade crossing violations are one of the many types of violations included in the safety assessment of each provincial regime.
- There is wide variation of grade crossing violations among the provincial regimes.
- Although the number of demerit points assessed to grade crossing violations (which, in fact, reflects a certain degree of severity in terms of violations) varies among provincial regimes, the seriousness of these types of violations seems to be recognized by the highest points assessed.
- Grade crossing violations were probably not a priority when provinces were deciding on the assessment to be given to these infractions.

Uniformity of treatment for contraventions at grade crossings was also investigated and two perspectives on the aspect of uniformity were highlighted.

- Inclusion of contraventions at grade crossings: This issue lacks focus. There is a wide divergence in terms of what provinces include in the list of contraventions to assess motor carriers' safety performance.
- Severity of treatment: The severity of treatment given to grade crossing contraventions varies by province. While the wording of the offence could differ by jurisdiction, the same contraventions should receive the same treatment across Canada.

The following question was also asked: Should occurrences involving a commercial vehicle at a grade crossing be treated differently than other occurrences? The case for treating it differently can probably be made on the basis of either the "logistical chain reaction" it can create or the risk of multiple fatalities in the case of an occurrence involving passengers or dangerous goods. It is very unlikely, however, that the safety assessment in itself would prevent such a tragedy from taking place.

This research revealed the existence of a Conviction Equivalency Table developed by the Canadian Council of Motor Transport Administrators (CCMTA) in 1997. The need for uniform treatment and severity of treatment for contraventions has long been recognized by the CCMTA. The CCMTA table is currently used in the three Prairie Provinces and, to a certain extent, all provincial/territorial jurisdictions have used it in establishing their safety assessment regimes. However, provinces like New Brunswick, Ontario and Quebec have chosen not to use the Conviction Equivalency Table at this stage.

The CCMTA Conviction Equivalency Table contains only two grade crossing violations. For both violations, the treatment recommended is three demerit points: the maximum number of points for violations other than Criminal Code violations.

The research also examined the recording of contraventions in driver profiles. It should be noted that Canada has had a uniform driver's licence for many years and the question of multiple licences being used by commercial drivers does not exist. Furthermore, all provincial and territorial jurisdictions have established a system of demerit points. These points are part of a driver's profile or abstract.

Violations to highway traffic regulations pertaining to grade crossings are treated the same as any other infraction. The violation is noted on the driver's profile and demerit points are assessed. This is, of course, in addition to the points assessed to the motor carrier for which that driver was working at the time.

Points assessed in a driver's profile can also lead to sanctions such as the suspension of a driver's licence. A contravention at a grade crossing would not disqualify a commercial driver unless that driver had accumulated enough points prior to pleading guilty to this new contravention. This nuance is significant since a long period of time may elapse between a court decision on a contravention and the day that infraction took place.

The link between driver profiles and motor carrier profiles exists in an implicit way. It is up to any motor carrier to verify its drivers' abstracts or driver profiles. While it is possible to make the link between the driver's profile and the motor carrier's profile more explicit, this would not seem to serve any specific purpose or resolve any major issues at this time.

In the United States, the emphasis for actions regarding grade crossing contraventions is on drivers. Grade crossing violations are not tied to U.S. Department of Transportation motor carrier safety ratings. The arduous task of data transfer from states, railroad companies and municipalities is raised as an obstacle for pursuing this issue.

The project concluded that the issue of grade crossing contraventions and occurrences has not received much attention during the debates across Canada on motor carrier safety assessment and rating. With so few occurrences involving commercial vehicles at grade crossings, the statistics tend to support those who favour a status quo. Furthermore, over the past several years, there has been a reduction in occurrences involving commercial vehicles at public grade crossings.

The project recommends different actions to all parties interested in this issue. These actions are aimed at improving safety at grade crossings:

- Better characterization of commercial vehicle operators involved in grade crossing contraventions and occurrences to identify the "offenders";
- Clear description of the types of contraventions at grade crossings to be included in motor carriers' safety assessment;
- Uniform treatment of demerit points given for contraventions;
- Clear description of commercial driver crossing contraventions including type and definition;
- Wider diffusion of Operation Lifesaver material to reach as many commercial vehicle operators as possible. The use of place mats at truck stops is one action that can reach many commercial vehicle operators.

The project confirmed that all parties take grade crossing occurrences as a serious safety concern and all are willing to cooperate to improve transportation safety in general.

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GLOSSARY

CDL:	Commercial Driver's License
CCMTA:	Canadian Council of Motor Transport Administrators
CVSA:	Commercial Vehicle Safety Alliance
FHWA:	Federal Highway Administration
FMCSA:	Federal Motor Carrier Safety Administration
FRA:	Federal Railway Administration
MVTA:	Motor Vehicle Transport Act
NSC:	National Safety Code
PIC:	Partners in Compliance
TDC:	Transportation Development Centre
TSB:	Transportation Safety Board of Canada
U.S. DOT:	United States Department of Transportation

1. INTRODUCTION

Canada has a total of 22,898 public grade crossings where 262 road vehicle-train occurrences took place in 2000. These resulted in 32 fatalities. Commercial vehicles were involved in 33 occurrences at public crossings in 2000 and, as a result of these occurrences, there were two fatalities and nine serious injuries. In an effort to reduce the number of collisions and their consequences, Transport Canada launched a collaborative effort called Direction 2006. The objective of this federal initiative, launched in 1996, is to reduce grade crossing and trespassing occurrences by 50 percent by 2006. As part of this initiative, Transport Canada's Rail Safety Directorate tasked the Transportation Development Centre (TDC) to develop and manage an R&D program designed to support the objectives of Direction 2006.

This research project is one of the projects supported by Rail Safety and TDC under their R&D mandates. It purports to address road safety-related behaviour and is especially aimed at commercial operators. This project goes beyond the traditional 3-E (Engineering - Education - Enforcement) approach traditionally used for grade crossing safety improvements. In a sense it would be classified as a "hybrid E", as it fits between Education and Enforcement.

It has long been recognized that an accident involving a heavy vehicle and a train may have far greater consequences than an accident involving a car and a train. In the United States, one of the most notorious occurrences was on October 25, 1995, when a commuter train crashed into a school bus in Fox River Grove, Illinois, killing seven children. A heavy vehicle-train collision can have potentially significant human, environmental and logistical repercussions, especially when the heavy vehicle and/or train is transporting dangerous goods or when passengers are involved.

Under proposed federal and provincial rules, motor carrier safety performances will be assessed and provincial governments will issue safety fitness certificates. This is often referred to the motor carrier safety rating process, which will take into consideration safety violations and infractions committed by commercial motor carriers and drivers. Infractions at grade crossings, among others, have long been part of provincial traffic regulations and therefore would be considered in motor carrier safety assessment.

This report specifically addresses the treatment of infractions and occurrences involving commercial vehicles at grade crossings under this new safety assessment and rating process. It examines whether that treatment is uniform throughout Canada and outlines the U.S. approach to this issue.

The report also discusses the manner in which commercial operators and insurance companies treat these infractions, and the mechanisms they may have to prevent these incidents and occurrences from happening. Finally, recommendations are presented for possible enhancement of safety at grade crossings through the recognition of grade crossing infractions in the safety assessment of motor carriers.

2. PROJECT SCOPE AND OBJECTIVES

This project examined infractions and occurrences at public grade crossings involving commercial vehicles as defined by the National Safety Code (i.e., vehicles over 4,500 kg). This includes vehicle types ranging from cube vans delivering courier or consumer goods to tractor semi-trailers. It also includes passenger buses with a capacity to transport 10 passengers or more (including the driver). Commercial drivers are those drivers holding a Class 1, 2, 3, 4 and 5 licence as defined under the National Safety Code (NSC). It is understood that some provinces have variations on those standards.

The objectives of this project are as follows:

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- Provide a brief description on the situation in the United States;
- Identify the level of awareness on the part of regulators and motor carriers regarding this issue;
- Make recommendations to enhance safety and national uniformity of treatment.

It was noted that the definition of an "event" at a grade crossing varies by level of government. Provincial road authorities often use the term "accident" or "collision" to describe an event involving a vehicle where the vehicle may have been disabled or a person may have been injured or killed. In the United States these events would be defined as a "crash". In the case of accidents taking place at a railway grade crossing, the Transportation Safety Board of Canada (TSB) would describe these events as an "occurrence".

The same situation exists for the use of the term "contravention". Provincial jurisdictions tend to use the terms "violations" and "convictions" for infractions committed under the highway traffic act and regulations rather than "contravention". At the federal level, the existence of the Contraventions Act has defined violations and infractions as contraventions.

For the purpose of this report, the terms "occurrence" and "contravention" will be used.

Information gathering for this project was conducted through a literature review and telephone interviews of government and motor carrier organization representatives.

3. LITERATURE REVIEW

Much of the literature pertaining to safety at grade crossings relates to the engineering aspect of grade crossings and, more recently, to the deployment of Intelligent Transportation Systems.[1] Research in the United States has often been motivated by high-profile occurrences involving school buses and the deployment of high speed rail systems in some heavily populated areas.

In Canada, research on grade crossings has focused on the engineering aspects of grade crossing (crossbuck design and ITS deployment) and on enforcement issues (mandatory stop at grade crossings for heavy vehicles transporting dangerous goods).

In the United States, research on grade crossing safety has been aided by two major initiatives. The first was the U.S. Department of Transportation (DOT) Rail-Highway Crossing Safety Action Plan released by the Secretary of Transportation in 1994. In that Plan, the U.S. DOT established a goal to reduce occurrences and fatalities by 50 percent within 10 years. The Plan also contains six specific initiatives, including increased enforcement and increased public education, as well as a research component.

The second major initiative was a Task Force established by the Secretary of Transportation following the 1995 Fox River Grove accident in which seven students died in a school bus-train accident. The Task Force directed its efforts to problem areas outside the scope of the 1994 Action Plan.

This Task Force produced a report entitled *Accidents That Shouldn't* Happen,[2] in which five grade crossing areas were identified for detailed examination: interconnected signals, vehicle storage space, high-profile crossings, light rail transit, and special vehicle operations. The last area – special vehicle operations – is probably the closest the Task Force came to dealing specifically with commercial vehicles and, in particular, heavy vehicles.

The report recognized that the responsibility for public grade crossings resides with state and local governments, railroads, and transit agencies. The recommendations dealt with driver licensing but more from the view of testing new applicants.

Neither of these major initiatives focused on the behavioural aspect of drivers at grade crossings nor did either deal specifically with motor carrier issues.

The literature search also identified one specific study covering behavioural research related to grade crossing occurrences. This study, conducted in the United States in 1998, indicated that between 10 and 20 percent of the motoring population is likely to engage in risky behaviour around railway grade crossings. These results came from a survey of 891 randomly selected residents in Michigan.[1]

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[1] A. Polk Gribbon, *ITS Applications to Railroad Crossing Safety: A Summary of U.S. Activities*, Jet Propulsion Lab/Maden Tech Inc, 1998.

[2] U.S. Department of Transportation, *Accidents That Shouldn't Happen*, report of the Grade Crossing Task Force to Secretary Frederico Pena, 1996.

It was striking that nearly 14 percent of the people interviewed stated that even if a train were in sight, they would proceed around the gates even with the warning lights flashing. Approximately 10 percent of the sample indicated they found it exciting to try and beat the train. These "risk seekers", as they are called in the paper, were more likely to be male and to have had personal frustrating experiences at grade crossings. The study recommended that communication campaigns target the specialized group of drivers that routinely try to beat the train – the risk seekers. It also recommended that communication campaigns address the frustrations of previous experiences.

The study did not, however, indicate whether the drivers in the sample were commercial drivers. This leads to an interesting observation about the need to identify the "risk seekers" among all drivers, and particularly commercial drivers, so that preventive programs can be applied.

With respect to the identification of so-called "risk seekers", but this time at a corporate level, some studies have been performed in the United States regarding the potential link between the financial and safety performance of motor carriers.[2] These studies showed that the pattern of accident rates is highest at the less profitable end of the scale. Under a motor carrier safety assessment and rating regime, these motor carriers would be rated as unsatisfactory and sanctions would follow. None of the analysis, however, was done with particular emphasis on grade crossing occurrences.

Furthermore, given the difficulty of conducting these studies in light of the type of information they require, they could not be duplicated in Canada, which unlike the United States, does not have a uniform classification of accounts that would allow such in-depth studies to be performed. In Canada, motor carrier expenses are classified according to good accounting principles and each motor carrier enters its expenses using its own code system.

The literature search did not identify any research on the relationship between grade crossing occurrences and motor carrier safety ratings. Nor did there seem to be any research on the treatment being given to such infractions as part of the assessment of the safety performance of motor carriers. One study in Canada was conducted on the more general theme of uniformity for motor carrier profiles and ratings. That study focused on rating systems in general and the topic of grade crossings was not addressed.[3]

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[1] K. Witte and W. Donohue, "Preventing Vehicle Crashes with Trains at Grade Crossings: The Risk Seeker Challenge", *Accident Analysis and Prevention*, 32, pp.127-138, 2000.

[2] United States General Accounting Office, Freight Trucking, *Promising Approach for Predicting Carrier's Safety Risks*, 1991.

[3] F. Nix, National Safety Code Standard # 14 – *Description and Analysis of Procedures, Road Safety and Motor Vehicle Regulations*, Transport Canada, 2000.

4. STATISTICAL REVIEW

Table 1 summarizes commercial vehicle involvement in occurrences at grade crossings.

Table 1 - Annual Grade Crossing Occurrences for Federally Regulated Railways

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Total	386	407	386	379	390	380	366	307	273	282	262
Commercial Vehicles Involved	54	53	35	55	47	65	53	49	33	49	46
Commercial Vehicles as % of Total	13.9	13.0	9.0	14.5	12.0	17.1	14.4	15.9	12.0	17.3	17.5

Source: Transport Canada, Occurrence Data Analysis and Reports

The data show that commercial vehicles represent a relatively significant proportion of occurrences at grade crossings, almost constantly over the 10 percent threshold. This 10 percent threshold is significant as it represents more than the approximate estimate of the proportion of commercial vehicles on the road; usually 5% of the total number of registered vehicles.[1] However, without exposure-level data it is impossible to speculate whether commercial vehicles are over-represented or under-represented in occurrences at grade crossings.

This report focuses solely on occurrences at public grade crossings in keeping with the objectives of the project. These crossings include both automatic and passive crossings. The occurrences take place on public highways and can easily be related to the safety assessment of motor carriers. Data for farm and private grade crossings may not be complete, especially where the occurrences involve only property damage.

Table 2 shows the types of vehicles involved by type of crossing. It notes that if occurrences at private and farm grade crossings are taken out, the number of occurrences involving commercial vehicles totals 33 in 2000. Over the five-year period between 1996 and 2000, there has been an average of 28 occurrences at public grade crossings. According to TSB, 88 percent of tractor trailers involved in grade crossing occurrences are struck by trains, compared to 67 percent for cars and 71 percent for straight trucks. There are few occurrences involving passenger buses or highway and rail vehicles transporting dangerous goods.

The data also show that injuries and/or fatalities vary greatly over the years. Fatalities have declined significantly and in 2000 there were only two fatalities as a result of occurrences between a commercial vehicle and a train.

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[1] Transport Canada, *Transportation in Canada 1999*, Annual Report., p. 158

Table 2 - Commercial Vehicle Involvement in Occurrences at Grade Crossings

Vehicle Type	Crossing Type	Year										
		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Bus	Automatic	0	0	1	0	1	0	0	0	0	0	0
	Passive	1	1	0	0	2	0	0	0	0	0	0
Dangerous Goods Involved*	Automatic	0	0	0	1	2	0	0	0	0	0	0
	Passive	0	1	1	0	0	0	1	0	2	0	0
Straight Truck	Farm	0	0	0	0	0	1	1	0	1	0	0
	Private	4	1	3	10	8	11	11	8	6	7	4
	Automatic	10	7	4	9	5	16	5	5	7	5	6
	Passive	14	10	6	16	12	21	14	16	7	7	4
Tractor Trailer	Farm	0	0	0	0	0	0	0	0	0	1	0
	Private	2	4	3	6	5	6	6	11	4	16	9
	Automatic	11	17	13	6	7	4	9	6	4	6	10
	Passive	12	12	4	6	5	6	6	3	2	7	13
Total		54	53	35	55	47	65	53	49	33	49	46
Public Crossing Only		48	47	28	37	32	47	34	30	20	25	33
Fatalities & Serious Injuries		5 0	6 0	9 2	6 11	7 2	2 6	1 9	1 6	3 0	1 9	3 3

* "Dangerous Goods Involved" means that dangerous goods were present and were transported by either a commercial vehicle or railway cars.

Source: Transport Canada, Occurrence Data Analysis and Reports

Table 2 shows that, excluding occurrences at private and farm grade crossings, the number of occurrences involving commercial vehicles increased to 33 in 2000 or 12.6 percent of the grand total for that year. In 1999 the percentage was 8.8 percent. The number of fatalities and serious injuries remained within the range of previous years. This represents a small percentage of total occurrences involving commercial vehicles. Although the involvement rate of 12.6 percent is superior to the involvement rate of commercial vehicles in total road occurrences, it still falls within the traditional area of around 10 percent.[1]

In 1999 the average number of occurrences for commercial vehicles at public crossings had declined by just over 30 percent compared to the average of the previous seven years. This reduction was in line with the objective of Direction 2006, which is to reduce grade crossing occurrences by 50 percent by 2006. The increase in 2000 in the number of occurrences involving commercial vehicles probably means that some special efforts may have to be devoted to that sector.

Table 3 shows the geographic distribution of these occurrences over a five-year period. British Columbia and Alberta have a much greater number of occurrences involving commercial vehicles as compared to their relative number of public grade crossings. Newfoundland's data is a sole occurrence that involved a commercial vehicle hitting a grade crossing post belonging to a national railway company, even though the rail tracks had been removed some time ago.

Table 3 - Geographical Distribution of Occurrences at Public Grade Crossings

Province (number of public crossings in brackets – total 22,898)	**% of Occurrences Involving Commercial Vehicles (1993-1998)**	**% of National Total**
British Columbia (1,085)	15%	4.7%
Alberta (3,762)	21%	16.4%
Saskatchewan (6,450)	13%	28.1%
Manitoba (3,047)	10%	13.3%
Ontario (5,481)	25%	23.9%
Quebec (2,577)	12%	11.2%
New Brunswick (325)	2%	1.4%
Nova Scotia (164)	1%	0.7%
Newfoundland (7)	1%	0.03%

Source: Transportation Safety Board

It is noted that the statistics in Table 3 cover only federally regulated railroads. Although some short line railways voluntarily report occurrences at grade crossings, most railways under provincial jurisdiction are not covered by TSB statistics. This could leave a small number of occurrences out of the statistical profile.

The Ministry of Transportation of Ontario provided the total number of contraventions at grade crossings in that province for the period from May 1999 to May 2000. Table 4 lists the contraventions by type and date of occurrence.

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[1] Transport Canada, *Transportation in Canada 1999*, Annual Report, p. 21.

Table 4 - Grade Crossing Contraventions – Ontario (May 1999 to May 2000)

Contravention Type	Date
Fail to stop at railway crossing	2000-04-07
Fail to stop at railway crossing	2000-03-28
Fail to stop at railway crossing	2000-01-28
Fail to stop at railway crossing	2000-01-11
Fail to stop at railway crossing	1999-11-25
Fail to stop at railway crossing	1999-07-04
Crossing railway barrier	1999-06-27
Fail to open door at railway crossing- public vehicle	1999-06-17
Fail to open door at railway crossing- school bus	1999-06-04
Fail to open door at railway crossing- school bus	1999-06-04
Fail to stop at railway crossing- school bus	1999-05-17

Source: Ministry of Transportation of Ontario

A total of 11 grade crossing contraventions were recorded during that period of time out of a total of 53,222 contraventions for all motor carrier profiles. Thus, grade crossing contraventions represent 0.02 percent of all contraventions in Ontario. At this stage, it is not possible to determine whether other provinces with public grade crossings experience the same level of contraventions. It is also not possible to estimate the total number of contraventions that actually occurred and therefore what the effective rate of detection is.

TSB statistics indicate that 25 percent of all grade crossing occurrences involving commercial vehicles take place in Ontario, or approximately seven per year over a five-year period. Thus, the number of recorded contraventions is higher than the number of occurrences.

Although many significant improvements have been made to the statistics on occurrences at grade crossings, the data do not cover items such as the type of motor carrier operation, the type of driver involved, etc. As a result, it is not possible to do such in-depth analysis as involvement by type of tractor-trailer, driver experience, etc. Such factors could be critical to the proper identification of the operators and individuals at greatest risk as an aid in developing appropriately targeted prevention programs.

In summary, the statistical review provided the following:

- In 2000, commercial vehicles were involved in 12.6 percent of the occurrences at public crossings across Canada for a total of 33 occurrences.
- This represents a small number of occurrences when considered in the context of total involvement by commercial vehicles in all road accidents (less than 1 percent).
- The number of fatalities and serious injuries is also small when considered in the same context.
- Grade crossing contraventions in Ontario represent a small percentage (0.02 percent) of the total number of contraventions in that Province. Other provinces likely have similar experience.

- 2000 marked an increase in the number of occurrences involving commercial vehicles. Before that year, there had been a reduction in occurrences involving commercial vehicles at public grade crossings over the preceding three years.
- Statistics, as currently gathered by TSB, do not allow specific analysis of the occurrences in terms of characteristics of the commercial fleets and drivers involved.

It is also noted that train crews collect information on near collisions. For instance, in 2000 Canadian National Railway Police alone recorded a total of 155 near collisions at their grade crossings. Unfortunately these data are not collected on a regular basis and could not be classified as scientific or reliable. Although interesting, these near-collision statistics do not add any valuable additional information for now. Similar data is gathered in the field of air safety but with much greater levels of detail and precision.

5. EXISTING HIGHWAY LAWS AND REGULATIONS

Contraventions and occurrences at grade crossings exist within a larger framework contained in laws and regulations. Because grade crossings involve safety in both the rail and road modes, references on this issue were found at both the federal and provincial/territorial levels.

This section provides details on federal and provincial/territorial laws and regulations covering the highway mode and in some cases, how it deals specifically with grade crossings. It also provides the regulatory background for the inclusion of grade crossing contraventions in motor carrier safety assessment.

On the rail side, the *Railway Safety Act* deals with grade crossing in the following manner: Section 26.2 of the *Railway Safety Act* stipulates that "the users of a road shall give way to railway equipment at a road crossing if adequate warning of its approach is given." This recognition of the right of way is also acknowledged in provincial regulations.

5.1 Federal Laws and Regulations, and Safety Assessment

The Government of Canada has the constitutional responsibility for regulating motor carriers (truck and bus) that operate interprovincially and internationally. The *Motor Vehicle Transport Act, 1987* (MVTA) in turn delegates this authority to the provinces and territories. New amendments to the MVTA were introduced in the House of Commons on March 2, 2000, but did not complete the legislative process prior to the election call. These amendments dealt specifically with motor carrier safety regimes. Similar amendments were introduced in the Senate on January 30, 2001 (Bill S-3).

The amendments to the MVTA will create a national framework for a provincially and territorially run regulatory system focused on the safety performance of motor carriers. This safety performance regime will be based on the NSC for motor carriers.

The NSC contains comprehensive standards addressing commercial vehicle operations. NSC standards are developed through committees made up of federal, provincial, territorial, industry and public interest representatives that report to government through the Canadian Council of Motor Transport Administrators (CCMTA). Provincial and territorial governments voluntarily implement these standards into laws and regulations.

The amendments to the MVTA will allow provinces and territories, whose safety compliance regimes are compatible with NSC standards, to give an extra-provincial carrier a safety rating and to issue to that carrier a safety fitness certificate, all under the authority of the Act. The safety fitness certificate will be recognized by other Canadian jurisdictions.

The amendments will also allow a province or territory, under the authority of the Act, to apply sanctions to extra-provincial motor carriers for poor safety performance, including downgrading their ratings and revoking their safety fitness certificates, and thus their right to operate.

The federal government also regulates other aspects of road safety, such as hours of service for commercial drivers, motor carrier operators, and for the transportation of dangerous goods by road. Extra-provincial motor carriers are also regulated by *Canada Labour Code* standards, which deal more with occupational health and safety rather than road safety.

5.2 Federal Contraventions Act

The *Contraventions Act* was adopted in 1992. The purpose of the Act is to establish a simplified procedure for prosecuting federal offences by ticketing instead of complex court proceedings under *Criminal Code* procedures. With this Act and the signing of administrative agreements between the provinces and the federal government, it is now possible to consider federal offences as contraventions enforceable by provincial/territorial enforcement officers. Even some municipalities, such as Ottawa and Mississauga, have signed agreements with the federal government to cover municipal parking infractions at international airports.

The Contraventions Regulations, made pursuant to section 8 of the Act, lists offences that have to be approved by the Governor in Council to become contraventions. This process is ongoing.

This new system, once fully implemented, will replace and improve the effectiveness of current enforcement procedures that are out of date and insufficient to properly control motor vehicle infractions and trespassers at grade crossings. Offences under the MVTA and the Commercial Vehicle Drivers Hours of Service Regulations are covered by these new procedures.

5.3 Provincial/Territorial Laws and Regulations

Provincial traffic laws and regulations literally cover all vehicles operated on public highways. As we have seen in Section 5.1, with the delegation of powers from the federal government to provincial and territorial administrations, this means that all commercial vehicles, operated by either an extra-provincial undertaking or an intra-provincial undertaking, would fall under provincial/territorial authority.

In that context, provincial/territorial laws and regulations have long included specific sections dealing with grade crossing contraventions. Typically the language used for regulating grade crossing is as follows:

1- General rules

1-1 When a driver is approaching a railway crossing *(a) where a "stop" or "arrêt" sign has been erected at the crossing, he shall stop the vehicle*

(i) not less than 5 metres from the nearest rail of the railway if the crossing is in a restricted speed area, and

(ii) not less than 15 metres from the nearest rail of the railway if the crossing is not in a restricted speed area,

and he shall not proceed unless he can do so in safety;

(b) when a clearly visible electrical or mechanical traffic control device gives warning of the approach of a railway train, he shall stop the vehicle as required by clause (a) and he shall not proceed while any such signal continues to give warning, unless a peace officer or flagman otherwise directs and he can do so in safety; but where the railway crossing is in a restricted speed area and the train is stopped or not in close proximity to the crossing, the driver may proceed to cross the railway crossing if he can do so in safety;

(c) when a crossing gate is lowered or a flagman is giving a signal of approach or passage of a railway train, or a railway train is in dangerous proximity to the crossing and is giving an audible signal or is visible, he shall stop the vehicle as required by clause (a) and he shall not proceed while the gate is lowered or the flagman continues to give warning of approach of a railway train, unless a peace officer or a flagman otherwise directs and he can do so in safety.

1-2 In this section "flagman" includes a brakeman or other trainman on a train of a railway who, in connection with the operation of a train, is warning people on a highway.

2- Stops by certain vehicles at railways

2-1 Except as provided in subsections (3) and (4), the driver of

(a) a vehicle carrying passengers for compensation; or
(b) a school bus carrying children; or
(c) a vehicle carrying flammable liquids or gas, whether or not it is empty;

approaching a railway crossing shall stop the vehicle not less than 5 metres, or more than 15 metres, from the nearest rail of the railway, and, with the vehicle stopped, shall

(d) look in both directions along the railway for an approaching train;
(e) listen for signals indicating the approach of a train; and
(f) in the case of a bus or school bus, open the door of the vehicle;

and he shall not proceed unless he can do so in safety.

2-2 Except as provided in subsection (4), where a driver has stopped and is proceeding as required in subsection (1), he shall cross the railway track in a gear that he will not need to change while crossing the track, and he shall not shift gears while crossing.

2-3 Subsection (1) does not apply where

(a) a peace officer or a flagman directs traffic to proceed; or
(b) the crossing is protected by gates or a railway crossing signal light which are not in operation at the time.

2-4 Subsections (1) and (2) do not apply to

(a) street railway grade crossing within a restricted speed area; or
(b) industrial spur railway crossings within a restricted speed area.

3- Driving through railway barrier

3-1 No person shall drive a vehicle through, around, or under a crossing gate or barrier at a railway crossing while the gate or barrier is closed or is being opened or closed.

4- Penalty

4-1 Any person who violates, contravenes, or disobeys or refuses, omits, neglects, or fails to observe, obey, or comply with

(a) any provision of this Act or of the regulations; or
(b) any municipal by-law duly passed under the authority of this Act; or
(c) any order of a peace officer, a traffic authority, the traffic board, the transport board, or other authority or person, lawfully given by him or it under this Act, or indicated or conveyed by a traffic control device;

is guilty of an offence and, unless another penalty is prescribed therefor herein or in any such by-law or regulation, is liable, on summary conviction, to a fine of not more than $500 and to suspension of licence for a term of not more than 30 days.

The above example is taken from the Manitoba *Highway Traffic Act*; however, it could have been taken from just about any provincial highway traffic act. One notable difference is the requirement in the province of Quebec for commercial vehicles transporting placardable quantities of dangerous goods to come to a full stop at all grade crossings. This specific regulation is identical to U.S. regulations that have been in place for several years.

The above example provides the background for defining the types of contraventions one would expect to find under a motor carrier safety assessment regime.

Appendix A provides full details for all relevant provincial regulations for driver governance at grade crossings.

5.4 National Safety Code

In 1986 the federal government and the provinces and territories agreed to a National Safety Code. The Code contains 16 standards covering everything from hours of work, load security, driver licensing and roadside inspection standards to the process for establishing a safety fitness rating. The NSC is not a regulatory document. It provides uniform guidelines to federal and provincial regulators for the development of road safety regulations.

Standard #14 is entitled Compliance Review – Safety Rating. It establishes the motor carrier safety rating framework in which each jurisdiction shall assess the safety performance of motor carriers and rate them.

The implementation of NSC Standard #14 by each province and territory is still an on-going process. By the end of 2000, the following provinces and territories had a motor carrier safety assessment and motor carrier rating systems substantially in place: Newfoundland, New Brunswick, Quebec, Ontario, Manitoba, Saskatchewan, Alberta and the Northwest Territories. In some cases the regulations in place may have some deviations from NSC Standard #14. At least, and for the benefit of this project, these jurisdictions have established an assessment of motor carrier safety performance. It should also be noted that other provinces and territories are in the process of either developing new regulations or amending existing regulations to meet NSC Standard #14.

As mentioned in Section 5.1 of this report, Transport Canada is in the process of providing the regulatory framework to provinces when dealing with extra-provincial motor carrier safety rating.

In summary, the legislative and regulatory framework exists for proper recognition of grade crossing contraventions at both the federal and provincial/territorial levels. Furthermore, with the implementation of NSC Standard #14 in all provinces and territories, and with the amendments to the MVTA, there will soon be a mechanism for treating those contraventions. Section 6 explains how these mechanisms work and covers specifically how grade crossing contraventions are treated under motor carrier safety assessment regimes.

6. MOTOR CARRIER AND COMMERCIAL DRIVER PROFILES

As stated in Section 5.4, many provinces have a process in place to assess and rate the safety performance of motor carriers. This section explains how this assessment process works and how contraventions and occurrences involving commercial vehicles at grade crossings are included in these processes.

The information gathered for this section of the report is from published documentation and interviews with provincial government officials. The assistance and cooperation of these officials was outstanding and provided considerable guidance in understanding a fairly complex issue.

6.1 Motor Carrier Safety Rating – Description

A motor carrier safety rating is a designation issued by provincial registrars to operators of commercial motor vehicles. These operators may be single entities known as owner-operators or large corporations operating large fleets of commercial vehicles. Ratings are assigned by each province to operators based in its province and, for some like Ontario, to all operators using its highways, regardless of whether these are based in its province. These ratings publicly identify the safety performance of commercial motor vehicle operators.

The objectives of safety ratings are to improve the safety of commercial vehicle operations, encourage the economic competitiveness of safe Canadian motor carriers, and encourage motor carrier safety education and continuous improvement.

Most provincial registrars issue one of four ratings as follows:

- Satisfactory
- Satisfactory-Unaudited
- Conditional
- Unsatisfactory

The exception is Ontario, where there are five possible ratings:

- Excellent
- Satisfactory
- Satisfactory-Unaudited
- Conditional
- Unsatisfactory

Alberta has a special recognition program, known as the Partners In Compliance (PIC) Program. Although PIC and Ontario's five-level rating system use different criteria, the end purpose is to recognize the "best" motor carrier operators from a safety point of view.

A carrier's safety rating is assigned based on information contained in that carrier's safety record. These records accumulate information on the following:

- Accidents – The motor carrier's vehicle is either disabled or injuries and/or fatalities were involved. As stated in Section 2, for the purposes of this project these will be referred to as occurrences.
- Convictions – This is a finding of guilt on charges by a court of law.
- Vehicle Inspections – This is a mechanical inspection performed on the road by a government authority under Commercial Vehicle Safety Alliance (CVSA) rules and guidelines. The CVSA inspection procedure is a North American standard.
- Interventions – This is action taken by a provincial/territorial government, such as warning letters, an interview or a facility audit.
- Sanctions – This may result in fleet limitation, plate seizure, or suspension or cancellation of a carrier's operating privileges.
- Facility Audits – This is a structured review of a motor carrier's books and records on the motor carrier's premises. It may also include the mechanical inspection of vehicles.

The facility audit is an important component of the rating programs. The audit complements the on-highway safety enforcement. During a facility audit, ministry personnel, or third-party representatives in some provinces, examine carrier records and documents related to the various NSC components. A carrier that is rated *Conditional* because of a failed audit score must pass another audit. Using Ontario as an example, a score of less than 55 percent on either the driver or vehicle component of the facility audit constitutes a failure. A score of greater than 80 percent on both the driver and vehicle components results in an *Excellent* rating.

To understand the ratings given to motor carriers, the example of Ontario is used to review what each category means. In Ontario, a motor carrier would normally be eligible for an ***Excellent*** safety rating if the following criteria were met:

- at least 24 months of demonstrated operation in Ontario,
- an overall violation rate of 10 percent or less of overall threshold,
- an accident violation rate of 10 percent or less of the accident threshold, and
- an audit score of 80 percent or better on both the driver and vehicle profiles.

A motor carrier would normally be eligible for a ***Satisfactory*** safety rating if the following criteria were met:

- at least six months of demonstrated operation in Ontario,
- an on-road performance level of 65 percent or less of its overall threshold, and
- an audit score of 55 percent or better on both the driver and vehicle profiles.

A motor carrier that has not been audited would normally receive a ***Satisfactory-Unaudited*** safety rating provided it maintained an on-road performance level of 65 percent or less of its overall threshold. It is possible that a motor carrier may remain in this category indefinitely.

A motor carrier may be considered for a ***Conditional*** safety rating if any of the following circumstances occur:

- an on-road performance level of more than 65 percent of its overall threshold,
- an audit score of lower than 55 percent in each of the driver and vehicle profiles, or
- the expiry of a suspension or plate seizure.

A motor carrier may be considered for an ***Unsatisfactory*** safety rating when its safety performance has deteriorated to such a degree that the motor carrier represents an unreasonable safety risk.

Motor carrier safety performance ratings are based on motor carrier violations with respect to reportable accidents, convictions, CVSA inspections and facility audit results.

- **Reportable Accidents:** Accidents with a minimum of $1000 in property damage and/or involving personal injury are assigned points based on the severity of the accident as indicated in Tables 5 to 7. Occurrences involving commercial vehicles at grade crossings would fall in this category.

  In some jurisdictions, accidents for which no improprieties or vehicle defects are noted on a police report still appear on the motor carrier file but do not incur points.

Table 5 - Demerit Points for Accidents Weighting Factor – Ontario

Severity	No Impropriety	One or more impropriety No Charges	One or more impropriety and Charges
Property Damage	0	2 points	4 points
Personal Injury	0	4 points	8 points
Fatal Injury	0	6 points	12 points

Source: Ontario Ministry of Transportation – *Carrier Safety Rating and Commercial Vehicle Operator's Registration System Public Guidelines*, 2000, p. 20.

Table 6 - Demerit Points for Accidents Weighting Factor – Quebec

Severity	No Impropriety	One or more impropriety and Charges
Property Damage	0	2 points
Personal Injury	0	4 points
Fatal Injury	0	10 points

Source: Société de l'assurance automobile du Québec, *Politique d'évaluation des propriétaires et exploitants de véhicules lourds*, 2000, p. 16.

Table 7 - Demerit Points for Accidents Weighting Factor – Manitoba

Severity	No Impropriety	At Fault Accidents
Property Damage	0	2 points
Personal Injury	0	4 points
Fatal Injury	0	6 points

Source: Manitoba Highways and Government Services, *Safety Ratings*, 2000.

- **Convictions:** Convictions resulting from charges are recorded on a motor carrier's file with point values based on safety severity. Grade crossing contraventions would fall under this category.

- **Inspections:** Mechanical inspections conducted according to CVSA standards are included. An inspection showing that the vehicle has failed the inspection represents one point and an out-of-service infraction incurs three points.

Motor carrier safety performances are based on three separate safety indicators:

- Accident points per vehicle per month;
- Safety-related conviction points per vehicle per month;
- Points on vehicle inspections per vehicle unit inspected.

Accidents are usually given double the weight of convictions and inspections in determining an operator's overall safety performance.

Reviews conducted by provincial personnel demonstrated a need to consider fleet size. Consequently, procedures were developed to establish threshold levels for each category of motor carrier according to fleet size. The percentage of threshold in each category was then combined in a weighted average to arrive at an overall percentage of thresholds. This average was determined using accident rates and safety-related conviction rates for each carrier and comparing them among carriers of varying sizes. The result is a standard by province that identifies unacceptable levels of performance by fleet size. Again, using Ontario as an example, Appendix B illustrates how thresholds are taken into account. Safety rating thresholds also take into account the percentage of travel within a province and the utilization of the vehicles. Thresholds for a given adjusted fleet size are calculated within a sliding two-year window. It should be noted that there are differences in threshold calculation and intervention levels among the provinces.

When a motor carrier reaches an unacceptable violation rate, the following disciplinary interventions and sanctions are triggered:

- Intervention Level 1: Warning Letter
  A warning letter is sent when a motor carrier violation rate exceeds 35 percent of its overall threshold.

- Intervention Level 2: Facility Audit
  An audit is triggered when a motor carrier's violation rate exceeds 65 percent of its overall threshold.

- Intervention Level 3: Interview
  An interview with the motor carrier may be triggered when a carrier's violation rate exceeds 80 percent of its threshold.

- Intervention Level 4: Sanctions
  When a motor carrier reaches 100 percent of its threshold, it could lead to the following sanctions:
  - restriction on the number of commercial vehicles the motor carrier may operate;
  - seizure of plates;
  - suspension of the motor carrier's operating privileges;
  - cancellation of the motor carrier's operating privileges.

For most provinces, the rating assessment given by a province to a motor carrier is available through the Internet. The information provided to the general public does not include details of the assessment, only the final outcome. Ratings can be seen on web sites such as Ontario http://www.carriersafetyrating.com and Quebec http://www.ctq.gouv.qc.ca. It is common belief that making this information available to the public in this fashion will increase the pressure on carriers to improve their rating, especially if shippers take this information into consideration when selecting motor carriers.

6.2 Contraventions Related to Grade Crossings and Severity of Treatment

In all cases, reportable accidents at grade crossings are included in the motor carrier safety rating. The definition of "reportable accident" may, however, vary from province to province and the number of demerit points assessed to an accident may vary between provincial regimes. Some provinces, Manitoba for example, only include accidents in which the commercial vehicle is at fault. Other provinces, like Quebec, include the accident in the company's file but do not assess demerit points in cases where the commercial vehicle is not at fault. Ontario goes one step further and assesses demerit points when improper behaviour or conduct is noted.

Traffic act violations are taken into account when assessing the safety performance of motor carriers. Violations at grade crossings are included in all provincial traffic acts and regulations. Consequently, they are taken into account in the safety assessment of motor carriers.

Table 8 provides a list of grade crossing contraventions for which a ticket is issued or for which there has been a conviction, and the associated demerit points assessed to motor carriers and commercial drivers. The table includes only provinces with a motor carrier safety rating system in place and where grade crossings exist.

Table 8 - Demerit Points Assessed to Motor Carriers for Grade Crossing Contraventions

	Demerit Points by Province(s)			
Contraventions	**NB**	**QC**	**ON**	**Prairie Provinces***
Failing to stop before a grade crossing when indicated or hazardous	3			3
Driving vehicle through or around barrier at grade crossing	3		3	
Failing to stop at stop sign at grade crossing	3			
Failing to stop at grade crossing		3		
Failing to stop at grade crossing when transporting explosives, flammable materials, or paying passengers	3			
Changing gears while crossing railway tracks at grade crossing	3			
Changing gears while crossing railway tracks at grade crossing – school and passenger bus			5	
Crossing railway tracks at grade crossing using a gear that needs to be changed – school and passenger bus			5	
Crossing railway tracks improperly at grade crossing	3			
Failing to look both ways at grade crossing – school and passenger bus			5	
Failing to stop at grade crossing – school and passenger bus			5	
Failing to open door at grade crossing – school and passenger bus			5	
Failing to stop a commercial vehicle at least five metres from railway tracks at grade crossing		3	3	
Engaging a vehicle on railway tracks at grade crossing without allowing enough space for that vehicle		3		
Performing a U-turn on/near grade crossing			2	
Stopping in the wrong place at grade crossing – school and passenger bus			5	
Stopping in the wrong place at portable signal at grade crossing			2	3

***Prairie Provinces have agreed to use the CCMTA Conviction Equivalency Table.**

This listing of contraventions by province shows Ontario including a total of 10 grade crossing contraventions as part of its safety assessment of motor carriers. Six out of these ten violations are assessed five demerit points, making that province one of the most severe in assessing demerit points. With the exception of Criminal Code violations, which are assessed between 10 and 30 demerit points, violations are assessed between zero and six demerit points. Therefore, grade crossing contraventions other than Criminal Code contraventions are assessed quite severely in Ontario.

For its part, New Brunswick lists six grade crossing violations for which demerit points are assessed. As in Ontario, Criminal Code violations are assessed the highest number of demerit points in New Brunswick. Other violations are assessed in New Brunswick between one and six demerit points. Therefore, three demerit points is neither severe nor light in terms of assessment.

Quebec and the Prairie Provinces only include two contraventions in their motor carrier assessments. In the case of Quebec, the highest assessment for violations – five demerit points – goes to Criminal Code violations. Most other violations are assessed between one and three points. Only one violation is assessed four points and it relates to overweight. Although Quebec does not include many grade crossing violations in its list of violations being assessed for the safety performance of motor carriers, at least the ones listed are assessed a fairly high ranking.

Interestingly, the Province of Quebec does not include as one of its contraventions the failure of commercial vehicles transporting placardable quantities of dangerous goods to stop at a grade crossing. This issue has raised a lot of attention for the past 10 years in Canada. Although it is required in the U.S., Quebec is the only province to mandate a full stop at grade crossing for all dangerous goods. New Brunswick has such a requirement for explosives and flammable liquids.

The Prairie Provinces have adopted the CCMTA Conviction Equivalency Table (see Section 6.4) under which Criminal Code violations are again given the highest ranking with five demerit points and other violations are assessed between one and three demerit points. Therefore, the two grade crossing violations are assessed the highest ranking in terms of severity. As in Quebec, the Prairie Provinces do not recognize in their contraventions the mandatory stop at grade crossings for motor carriers transporting certain classes of dangerous goods such as flammable liquids.

In summary, the review of violations/contraventions by province revealed the following:

- Grade crossing violations are one of the many types of violations included in the safety assessment of each provincial regime.
- There is wide variation of grade crossing violations among the provincial regimes.
- Although the number of demerit points assessed to grade crossing violations (which, in fact, reflects a certain degree of severity in terms of violations) varies among provincial regimes, the seriousness of these types of violations seems to be recognized by these high points assessed.
- Grade crossing violations were probably not a priority when provinces were deciding on the assessment to be given to these infractions.

6.3 Uniformity of Treatment for Contraventions and Occurrences

Uniformity of treatment for contraventions and occurrences at grade crossings can be seen in two perspectives: inclusion of violations and uniformity in the treatment of violations and occurrences.

- Inclusion of grade crossing contraventions

As seen in Table 8, it is clear that the issue of grade crossing contraventions lacks focus. There is a wide divergence in terms of what provinces include in the list of contraventions to assess motor carrier safety performance. This has repercussions since the exclusion of grade crossing contraventions means that not all actions at grade crossings are accounted for in the motor carrier rating. The recording of contraventions may assist in identifying individuals and operators who represent a greater risk of being involved in an occurrence at grade crossings. This may be particularly relevant in the case of motor carriers transporting passengers or dangerous goods.

- Severity of treatment
  - ➢ Grade crossing contraventions

    The severity of treatment given to grade crossing contraventions varies by province. While the wording of the offence could differ by jurisdiction, the same contraventions should receive the same treatment across Canada. Changing gears while crossing a railway crossing may serve to illustrate this point. In New Brunswick, such a contravention is given three demerit points while in Ontario, for school and passenger buses only, the same contravention is given five demerit points. Other provinces do not include this on the list of contraventions. Failure to stop at a grade crossing when transporting dangerous goods is another example.

    Perhaps some effort should be devoted to establishing a national list of contraventions for which the severity of punishment is uniform across Canada.

  - ➢ Grade crossing occurrences

    It is emphasized that occurrences at grade crossings are accounted for in all existing safety assessment regimes of all provincial jurisdictions. As described in Section 6.1, occurrences fall under three categories: occurrences with property damage, occurrences with injury, and occurrences with fatality. Points are assigned to a motor carrier's profile for an "at fault" occurrence according to the severity of the occurrence (Tables 5 to 7).

    Although the degree of severity given to occurrences differs from province to province, the principle is nevertheless the same for all provinces with safety regimes in place.

    Of course, this begs the question: Should occurrences involving a commercial vehicle at a grade crossing be treated differently than other occurrences? The case for treating it differently can probably be made on the basis of either the "logistical chain reaction" it can create or the risk of multiple fatalities in the case of an occurrence involving passengers or dangerous goods. Only one occurrence involving many lives either on a train or road vehicle or within a community would suffice to trigger reactions demanding that the motor carrier involved be given the worst possible rating leading to the removal of its operating authority. It is very unlikely, however, that the safety assessment in itself would prevent such a tragedy from taking place.

None of the provincial jurisdictions contacted had given any thought to treating occurrences at grade crossings any differently than any other occurrences. In their view, these occurrences fall under the same category as the others. This reaction is probably to be expected in view of the low ratio of contraventions to occurrences at grade crossings which, looking specifically at Ontario, is less than two to one. Ratios of fifty to one may be a scale where enforcement actions could be more easily justified.

At this stage, treating a grade crossing occurrence differently than any other occurrence would probably be qualified as "overkill" by federal/provincial/territorial road safety authorities.

6.4 CCMTA Conviction Equivalency Table

This research revealed the existence of a Conviction Equivalency Table developed by the CCMTA in 1997. The need for uniform treatment and severity of treatment for contraventions has long been recognized by the CCMTA. The purposes of the table are as follows:

- Allow for coordination of convictions committed by drivers and carriers to exchange information in a standardized format;
- Provide sufficient generic coding and categories to ensure the comprehensive exchange of convictions;
- Provide assurance to the jurisdiction in which the conviction occurred that the conviction can be more easily understood by the receiving jurisdiction through the use of a standard format;
- Provide a reference matrix that eliminates the need for continual cross-referencing of other jurisdictions' legislation and regulations;
- Provide a comprehensive list of generic codes;
- Provide clarification as to the nature of the offence.

The CCMTA table is currently used in the three Prairie Provinces and, to a certain extent, all provincial/territorial jurisdictions have used it in establishing their safety assessment regimes. However, provinces like New Brunswick, Ontario and Quebec have chosen not to use the Conviction Equivalency Table at this stage.

The CCMTA Conviction Equivalency Table contains only two grade crossing violations. For both violations, the treatment recommended is three demerit points: the maximum number of points for violations other than Criminal Code violations.

6.5 Commercial Driver Profile

Canada has had a uniform driver's licence for many years and the question of multiple licences being used by commercial drivers does not exist. Furthermore, all provincial and territorial jurisdictions have established a system of demerit points. These points are part of a driver's profile or abstract.

Violations to highway traffic regulations pertaining to grade crossings are treated the same as any other infraction. The violation is noted on the driver's profile and demerit points are assessed. This is, of course, in addition to the points assessed to the motor carrier for which that driver was working at the time.

Points assessed in a driver's profile can also lead to sanctions such as the suspension of a driver's licence. It is the responsibility of the motor carrier to check the profiles of its drivers to make sure that they are up to date. Generally speaking, motor carriers have used a release form for years allowing them to access their employees' driver profiles. Drivers usually sign this release form when starting employment for a motor carrier.

Contraventions will also trigger reactions on the part of insurance companies, who usually reward a good driving record with lower premiums and increase premiums for drivers with bad driving records. The same is true for provinces where there is a government insurance plan in place. The assessment of demerit points results in an increase in insurance premiums. In Quebec, for instance, insurance premiums increase as follows:

Demerit points	Premium paid every second year (Cdn$)
1 - 3	22.94
4 - 7	45.87
8 - 11	79.82
12 - 14	131.19
15 or more	182.57

Generally speaking, all driver infractions result in a loss of three to nine points on a driver's profile.

Table 9 - Demerit Points Assessed to Commercial Drivers for Grade Crossing Contraventions – Quebec

Contraventions	Demerit Points
Failure to stop at grade crossings	3
Failure to stop at grade crossings – Bus and school bus drivers	9

In the Province of Quebec, for all commercial vehicle drivers, failure to stop at grade crossings results in an assessment of three points. Bus and school bus drivers failing to stop at a grade crossing are assessed an additional six points. In addition, fines of up to $500 may be imposed. As Section 8 reveals, this approach differs from the approach recently taken in the United States where commercial driver's licence is suspended when a grade crossing contravention is committed. In Canada, a commercial driver's licence is suspended only when a total of 15 points have been accumulated over a sliding window period of two years.

A contravention at a grade crossing would therefore not disqualify a commercial driver unless that driver had accumulated enough points prior to pleading guilty to this new contravention. This nuance is significant because a long period of time may elapse between a court decision on a contravention and the day that infraction took place.

The link between driver profiles and motor carrier profiles exists in an implicit way. It is up to any motor carrier to verify its drivers' abstracts or driver profiles. While it is possible to make the link between the driver's profile and the motor carrier's profile more explicit, this would not serve any specific purpose or resolve any major issues at this time.

7. INDUSTRY VIEWS ON SAFETY AT GRADE CROSSINGS

The motor carrier industry is generally concerned about occurrences at grade crossings. Some carriers take an active role in the promotion of safety at grade crossings by participating in local safety leagues and similar safety organizations. However, because there are so few occurrences involving commercial vehicles at grade crossings, grade crossing safety is not a pressing priority. It was found that the material produced by Operation Lifesaver does not reach many representatives of the trucking industry. Operation Lifesaver is a not-for-profit organization dedicated to informing the public about the risks involved with grade crossings. It also produces information and educational material on safety at grade crossings. Over the years, Operation Lifesaver has produced a variety of information and educational material for commercial vehicle operators, including a video entitled *The Gallery*.

In the course of this project, five motor carriers, one insurance company and a school bus operator were interviewed:

- Bourassa Transport
- Economy Carriers
- Orléans Express
- Robert Transport
- Thomson Terminals
- Markel Insurance of Canada
- New Brunswick Department of Education-School Bus Coordinator

Bourassa Transport is an LTL motor carrier based in Saint-Jean-sur-Richelieu, Quebec, and it has more than 125 employees. It operates between Quebec, Ontario and the United States, and employs a few owner-operators for long-haul transport. In 1997, Bourassa had one accident at a grade crossing in the United States. Its main terminal is very close to a rail mainline so drivers are generally aware of the risk involved. Following the 1997 accident, Bourassa Transport implemented a procedure requiring drivers to lower their side window at railway crossings and listen for train whistles. The company was not aware of the information available under Operation Lifesaver.

Economy Carriers is based in the province of Alberta. It operates more than 350 commercial power units and specializes in the bulk transport of dangerous goods. It has three divisions: fuel, waste and freight. It has not yet had an accident at a grade crossing. For some time now, the company has been inviting railway company representatives to speak to its drivers each year about Operation Lifesaver. It is quite familiar with the Operation Lifesaver material, including the video *The Gallery*.

Orleans Express is based in Montreal, Quebec, and operates both scheduled and charter bus service. It has approximately 60 motorcoaches on its scheduled runs. Its charter division is known as Autocars Dupont. Buses are required by law throughout Canada to stop at all railway crossings. The company administers its own training school and has developed a training procedure for grade crossings that requires its drivers to stop the vehicle, open the door and listen.

Robert Transport is a for-hire fleet based in Boucherville, Quebec, operating 1000 power units. It employs 825 drivers and just over 200 owner-operators. The company offers an interesting feature regarding grade crossing – it has a private rail crossing in the middle of one of its main yards in Boucherville. Robert Transport was aware of Operation Lifesaver but not specifically of the information it produces.

Robert Transport's personnel could not recollect having had a single accident or violation at a grade crossing. The company is concerned about safety at grade crossings and its safety information program contains material on the subject. It has five full-time trainers on staff and offers a full range of training programs to its employees. Its training program on dangerous goods deals with Quebec regulations regarding mandatory stops at grade crossings when transporting placardable quantities of dangerous goods. It has been involved in the development of a motor carrier safety assessment for the Province of Quebec and is well aware of the processes involved.

Thomson Terminals is based in Mississauga, Ontario, and operates between central Canada and the United States. It has approximately 150 power units with a mix of employee drivers and owner-operators. As a general procedure at the time of hiring, the company does remind its drivers to be careful at grade crossings. Thomson Terminals was not aware of the Operation Lifesaver material. It believes that the process of railway rationalization over the past years has meant fewer grade crossings for Ontario-based carriers.

Markel Insurance Company of Canada specializes in insuring commercial transport fleets and has more than 400 transport fleets as clients. Markel also operates a training school for commercial drivers in Guelph, Ontario. It is familiar with Operation Lifesaver. The company usually gets involved in accidents when the property damage is more than $5000, as this is the lowest deductible for most motor carriers' insurance policies. Because Markel has had very few claims from its clients concerning that type of occurrence it does not consider occurrences at grade crossings to be a pressing issue.

In New Brunswick, the vast majority of school buses are owned and operated by the **New Brunswick Department of Education**. According to the Department's statistics, 1200 school buses are operated each day during the school year in New Brunswick. Of this total, 1100 are operated and owned by the Department of Education. Therefore, most of the school bus drivers in New Brunswick are government employees.

This situation is not a typical one since, for most other provinces and territories, school buses are owned and operated by private companies.

In New Brunswick, all new school bus drivers must go through a week-long training program. Grade crossing practices and regulations are a part of that program. The Department complains, however, that the province's driver handbook does not contain any pictures showing grade crossing signs. Experiences school bus drivers must undergo an eight-hour refresher training program once a year and grade crossing safety is a part of that program as well.

The training emphasizes the need to open doors and windows at grade crossings. It also reinforces the fact that commercial drivers are not allowed to change gears while driving school buses and crossing railway tracks.

The persons responsible for school bus safety and training at the Department of Education were aware of some safety problems at grade crossings. These problems did not lead to any occurrences and corrective actions were taken with the drivers involved.

Department officials were not aware of provincial initiatives to assess the performance of commercial vehicle operators. They believe that, generally speaking, because most school buses in New Brunswick are owned and operated by the Department of Education, their vehicles are not treated in the same manner as other commercial vehicles. They do think, however, that this should change and that governmental commercial vehicles and drivers should be subject to the same penalties and sanctions as other commercial vehicles and drivers.

The Department makes use of Operation Lifesaver material as part of its training program and believes it needs to expand on that program by recruiting three master trainers to cover the province. It is also keen to support the development of a new national network of organizations involved in school bus transportation. The first meeting of this new network took place last year in St John, New Brunswick. The next meeting is scheduled for Penticton, British Columbia, in May 2002.

It is clear from these discussions that most motor carriers are doing something to minimize the risk of occurrences at grade crossings. It seems that although provincial safety leagues have traditionally played a stronger role in commercial driver training, the Operation Lifesaver program is better known and more likely to be used. It also clear that the issue of grade crossing contraventions is not high on their list of priorities.

All industry representatives thought that although the issue of safety at grade crossings is a serious matter, they consider the current safety assessment and rating to be sufficient. None of the motor carriers were aware of the difference in treatment given to grade crossing occurrences and contraventions by different jurisdictions. All were surprised to hear that in 1999 there was a total of 49 occurrences at grade crossings involving commercial vehicles.

8. OVERVIEW OF SITUATION IN THE UNITED STATES

In the United States, grade crossings are the responsibility of state and municipal governments and railroad operators. The United States' approach to motor carrier safety rating and violations at grade crossings differs somewhat from Canada's. In the United States, the federal government is responsible for railroad regulations and safety regulations for the operation of a commercial vehicle used for interstate commerce. The agency responsible for the administration of the motor carrier industry is the Federal Motor Carrier Safety Administration (FMCSA). The Federal Highway Administration (FHWA) is also involved in grade crossings but only for infrastructure projects such as grade separation.

The FMCSA is responsible, among other things, for the assessment of the safety rating of motor carriers and for the establishment of railroad crossing rules for drivers and motor carriers.

The Federal Railroad Administration (FRA) is responsible for rail regulations; therefore, safety rules governing grade crossing operations fall under the FRA.

8.1 Motor Carrier Safety Assessment Process

The United States has also established procedures to determine the safety fitness of motor carriers and assigns safety ratings using three categories: satisfactory, conditional and unsatisfactory. The factors considered in determining the safety fitness of motor carriers are as follows:

- Adequacy of safety management controls;
- Frequency and severity of regulatory violations;
- Frequency and severity of vehicle/driver regulatory violations identified in roadside inspections;
- Number and frequency of out-of-service driver/vehicle violations;
- Increase or decrease in similar types of regulatory violations discovered during safety or compliance reviews;
- Frequency of accidents, hazardous materials incidents, accident rate per million miles and other accident indicators;
- Number and severity of violations of state safety rules, regulations, standards and orders compatible with federal rules, regulations, standards and orders.

The FMCSA also uses a methodology to a weigh motor carrier's size and operational characteristics.

The FMCSA uses a tool called SafeStat (Safety Status Measurement System) to assist in establishing priorities for compliance review of motor carriers. SafetStat is an automated, data-driven analysis system designed to incorporate current on-road safety performance information on all motor carriers with on-site compliance review and enforcement history information to measure relative motor carrier safety fitness.

SafeStat output is called a Safety Evaluation Area value. It currently uses the following data:

- State-reported commercial vehicle crash data;
- Compliance reviews following on-site inspections;
- Violations resulting from on-site inspections;
- Violations resulting from roadside inspections;
- Motor carrier census data.

The following regulations are used in compliance review by federal and state inspectors:

- Drug and alcohol testing;
- Commercial driver's licence standards;
- Minimum insurance;
- Qualifications of drivers;
- Driving of motor vehicles;
- Parts and accessories necessary for safe operations;
- Hours of service;
- Inspection, repair and maintenance;
- Hazardous materials.

SafeStat uses normalized safety-event data to measure the safety compliance and performance of individual motor carriers. Carrier size and exposure are taken into account. Some data are also weighted to take severity into account. For instance, a crash with property damage only is assigned one point, whereas an accident with injuries and fatalities is assigned two points.

The primary use of SafeStat is to identify and prioritize motor carriers for FMCSA and state safety enforcement programs. A link to SafeStat is available to the public via the Internet on FMCSA's website under the keyword Analysis & Information Online.

FMCSA officials stated that they currently do not take grade crossing violations into account in their ratings and SafeStat system. Occurrences at grade crossings are recorded just as any other accident as long as they are reported.

8.2 Grade Crossing Contraventions

Grade crossing contraventions are focused on drivers and occurrences. Driver infractions at grade crossings have been investigated by the FHWA under a mandate spelled out in the *Interstate Commerce Commission Termination Act of 1995*. The Act required the FHWA to develop rules, including sanctions and penalties, to improve truck driver behaviour at rail crossings. Subsequent to a major accident in March 1998, when an Amtrak train hit a steel-hauling tractor trailer killing 11 train passengers and injuring more than 100 others, the FHWA issued a rulemaking notice. New regulations were introduced in 1999.

This rulemaking established new railroad crossing rules and imposed new penalties on commercial drivers. Under these rules, commercial drivers are subject to the following penalties:

- For a first violation, suspension of the Commercial Driver's License (CDL) for at least 60 days;
- For a second violation within three years, the suspension period is at least 120 days;
- For a third violation within the three-year period, the suspension period is at least one year.

The rules further state that a motor carrier that knowingly permits or requires a driver to violate any of these rules is subject to a fine of up to $10,000.[1] The actual penalties are decided by the court system where the infraction took place.

Drivers can be disqualified from driving if they commit one of the following contraventions:

- Failing to slow down and ensure the tracks are clear of an approaching train;
- Failing to stop if a train is approaching;
- Hazardous materials carriers and passenger vehicles failing to stop at any crossing, which they must do under current law;
- Failing to have sufficient space to drive completely through a crossing without stopping;
- Failing to obey a traffic control device or directions of an enforcement official;
- Failing to negotiate a crossing because of insufficient undercarriage clearance.

At the request of state governments, a three-year grace period (until 2002) was granted before these new rules take effect to give states time change their laws to meet these new standards. Failure to do so could mean a loss of FMCSA Program funds.

More recently, the FMCSA proposed new rulemakings that would disqualify commercial drivers from driving if they are convicted of certain offences while driving any vehicle. The proposed rulemaking would require states to disqualify a driver's CDL upon conviction, and employers would be required to prohibit these disqualified drivers from operating commercial motor vehicles. The purpose of the proposal is to improve safety by ensuring that only safe drivers operate large trucks and buses. One of the offences that would disqualify a convicted driver is violating railroad-highway grade crossing signs.

8.3 Summary – United States

In the United States, the emphasis for actions regarding grade crossing contraventions is on drivers. Grade crossing violations are not tied to U.S. DOT motor carrier safety ratings. The arduous task of data transfer from states, railroad companies and municipalities is raised as an obstacle for pursuing this issue.

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[1] J. Thomas, "New CDL Rules for Railway Crossing Infractions", *Commercial Carrier Journal*, October 1999, p. 10.

This emphasis on drivers also means that, as in Canada, the cooperation of local authorities is needed. If all states endorse the approach and bring in the enabling legislation, then the measure may be an incentive for caution on the part of drivers at grade crossings. It is premature to know whether this measure will help to reduce occurrences at grade crossings involving commercial vehicles.

The FRA also plays a role in the safety of grade crossings from a highway perspective by maintaining a database referred to as a hazard index. This index takes into account occurrences at all grade crossings and then rates each crossing from a risk perspective. This data is used for infrastructure projects at grade crossings.

In summary, U.S. regulators do not single out grade crossing violations as part of their carrier risk assessment. They enter grade crossing occurrences as they would any other occurrences. At the moment, the FMCSA conducts 10,000 to 12,000 compliance reviews a year. It is under pressure from a law passed by Congress in 1999 (the *Motor Carrier Safety Improvement Act of 1999*) to introduce new entry requirements. Should they be forced to do compliance reviews for new entrants, an additional 40,000 per month would be required.

It also appears that the United States has not yet researched the manner in which it could treat both occurrences and contraventions at grade crossings as part of the motor carrier safety rating process.

9. CONCLUSIONS AND RECOMMENDATIONS

It appears that the issue of grade crossing contraventions and occurrences has not received much attention during the debates across Canada on motor carrier safety assessment and rating. With so few occurrences involving commercial vehicles at grade crossings, the statistics tend to support those who favour the status quo. Furthermore, over the past several years, there has been a reduction in occurrences involving commercial vehicles at public grade crossings.

At the same time, Direction 2006 provides an opportunity to bring guidance and focus to all concerned with improving transportation safety. The area of commercial vehicle safety at grade crossings can benefit from the fact that the operators and drivers of these vehicles are subject to safety assessments and safety rating processes. These processes provide a focus for action in enabling enforcement agencies to properly identify the "offenders" at grade crossings. Furthermore, these processes will soon be national and international in scope.

There is no doubt that all parties involved treat occurrences and contraventions involving commercial vehicles at grade crossings seriously. However, because there are so few occurrences, the issue has not been given high priority in the new motor carrier safety assessment and safety rating regimes. Nevertheless, provincial officials are not adverse to reviewing this issue if increased safety is the underlying objective and outcome of the review.

It was noted that contraventions at grade crossings are treated differently in Canada and the United States. In the United States, severe sanctions are focused squarely on drivers whereas in Canada, the sanctions are focused more on motor carriers and, to a lesser extent, on commercial drivers.

To achieve increased safety in line with Direction 2006 objectives of a 50 percent reduction of occurrences at grade crossings by 2006, the following three areas could lend themselves to action:

Statistics: Proper identification of the characteristics of the motor carriers and commercial drivers involved in grade crossing occurrences and contraventions would aid in targeting future actions for their reduction. This would probably be a normal evolution of the statistics currently being collected. Some years ago there was a debate on how the statistics for commercial vehicles involved in occurrences were tabulated. The complaint was that the term "truck", was too broad and general. That situation has now been corrected. It now may be time to obtain more information about the characteristics of the motor carrier companies and drivers involved. Without this refinement in the statistics gathered, it is difficult to properly target any program. It should be noted that a certain level of detail already exists in provincial police reports.

This refinement is also important in view of the heterogeneity of the motor carrier industry. The vast majority of commercial vehicle operators are small corporations operating fewer than 10 vehicles. In some provinces more than 80 percent of transport fleets, both for-hire and private fleets, operate *fewer than 10 vehicles*. The number of corporations and individuals involved is in the hundreds of thousands. In terms of vehicles, it is estimated that more than 750,000 commercial vehicles are operated in Canada. There are also U.S.-based commercial vehicles crossing the border that add to this total.

To properly identify the "offenders" and develop proper communications and enforcement campaigns, any refinement to the statistics gathered would help to further refine the motor carrier safety assessment and motor carrier rating processes.

Moreover, although grade crossing occurrences and contraventions occurring at provincially regulated railroads are accounted for within provincial regimes, they are not included in TSB statistics. This means that should these occurrences be included, the number of occurrences at grade crossings as reported by TSB might be slightly higher.

Regulations: This was one of the focus areas for this project, which has shown that grade crossing occurrences and contraventions are incorporated in current Canadian motor carrier safety assessment and rating regimes. The fact that it may have been given a low priority may reflect the small number of occurrences as a proportion of the total number of occurrences involving commercial vehicles. However, it has been shown that occurrences and contraventions involving commercial vehicles at grade crossings do take place. The risk they pose must also be taken into consideration.

What was found was more a lack of uniformity in both the types and treatment of contraventions included in motor carrier safety assessment rather than a lack thereof.

There are mechanisms that can be used to correct this lack of uniformity in treatment. Federal regulations would seem to provide an avenue for uniform treatment by provincial regimes. The case of Criminal Code violations supports this hypothesis. However, insertion of regulatory language under the MVTA to deal specifically with grade crossing occurrences and contraventions would probably be considered an extreme solution.

The existence of the CCMTA Conviction Equivalency Table indicates that a considerable amount of work has already taken place on the issue of uniform identification of contraventions and sanctions. It seems that the best alternative for uniform treatment is to build on this work. In this particular case, the CCMTA table could be a useful tool in providing the following:

- Definition of the types of grade crossing contraventions to be included in motor carrier assessment across Canada;
- Uniform language for all grade crossing contraventions included in the CCMTA table;
- Uniform assessment of the severity of the grade crossing contraventions and occurrences.

Uniformity in the types and treatment of grade crossing contraventions across Canada may be the first step in establishing a role for grade crossing contraventions in the motor carrier *safety rating process.*

This work would also help to better understand the difference in approaches taken in Canada and the United States on this issue.

Communications: Industry interviews have shown that not everybody in the motor carrier community is aware of Operation Lifesaver. This should be corrected with a campaign in partnership with organizations that work closely with the motor carrier community. However, since not much is known about the characteristics of the operators involved in grade crossing occurrences and contraventions, it is difficult to focus on that particular aspect at this stage. What tools and media should be used to reach the individuals more likely to take risks at grade crossings? This is a fundamental question since preaching to the converted would not provide an optimal return on investment. The issue of communications is therefore linked closely to the issue of improved statistics.

In the meantime, one action that could be taken to reach many commercial vehicle operators would be to distribute information material on grade crossing safety through alliances with companies that distribute products to all commercial vehicle operators regardless of the size of vehicles they use. Oil companies as well as vehicle and engine manufacturers could provide excellent distribution channels to all commercial vehicle operators.

Another action could be to have a booth with relevant material at truck shows across Canada. Many commercial vehicle operators attend these shows and take the time to visit kiosks as long as the material presented is relevant to them.

Truck stops also present a good opportunity to reach commercial vehicle operators. For instance, placemats used in these facilities have proven their effectiveness as useful communication tools for other safety campaigns such as the Share the Road campaign.

In summary, this project recommends different actions to all parties interested in improving safety at grade crossings:

- Better characterization of commercial vehicle operators involved in grade crossing contraventions and occurrences to identify the offenders;
- Clear description of the types of contraventions at grade crossings to be included in motor carriers' safety assessment;
- Uniform treatment of demerit points given for contraventions;
- Clear description of commercial driver crossing contraventions including type and definition;
- Wider diffusion of Operation Lifesaver material to reach as many commercial vehicle operators as possible. The use of place mats at truck stops is one action that can reach many commercial vehicle operators.

The project confirmed that all parties concerned take grade crossing occurrences as a serious safety concern and are willing to cooperate to improve transportation safety in general. Any action taken to identify and eliminate the "offenders", however incremental in nature, can only help and support Direction 2006 objectives.

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APPENDIX A

PROVINCIAL HIGHWAY TRAFFIC ACTS AND REGULATIONS, AND RELEVANT *RAILWAY SAFETY ACT* SECTIONS

This section contains legislative provisions related to driving offences at railway crossings for British Columbia, Alberta, Saskatchewan, Ontario, Quebec, New Brunswick, and Nova Scotia. It also contains related federal legislation under the *Railway Safety Act*, including provisions from the *Contraventions Regulations*.

British Columbia

Motor Vehicle Act, R.S.B.C. 1996, c. 318.

Railway Crossings

185 (1) When a driver is approaching a railway crossing at a time when

(a) a clearly visible electrical or mechanical signal device gives warning of the approach of a railway train,

(b) a crossing gate is lowered or a flagger is giving a signal of the approach or passage of a railway train, or

(c) a railway train is approaching and is within approximately 500 m of a crossing or by reason of its speed or nearness to the crossing is an immediate hazard and emits an audible signal or is visible,

the driver must stop the vehicle within 15 m but not less than 5 m from the nearest rail of the railway, and must not cause or permit the vehicle to proceed until he or she can do so safely.

(2) A person must not drive a vehicle through, around or under a crossing gate or barrier at a railway crossing while the gate or barrier is closed or is being opened or closed.

(3) If a stop sign is erected at a railway crossing, a driver approaching the railway crossing

(a) must stop his or her vehicle

(i) no closer than 5 m, and

(ii) no farther than 15 m from the nearest rail of the railway, and

(b) must not proceed until he or she can do so safely.

(4) Except at a railway spur line or an industrial track in a business or residence district, the driver of

(a) a bus carrying passengers for compensation,

(b) a school bus carrying a child,

(c) a vehicle carrying explosive substances or any poisonous or flammable substance as cargo, or

(d) a vehicle used to carry flammable liquids or gas, whether or not it is then empty,

approaching a railway crossing that is not protected by gates or railway crossing signal lights, unless otherwise directed by a flagger, must

(e) stop his or her vehicle

(i) no closer than 5 m, and

(ii) no farther than 15 m from the nearest rail of the railway,

(f) remaining stopped, must listen and look in both directions along the railway for an approaching train, and for signals indicating the approach of a train, and

(g) must not proceed until he or she can do so safely.

(5) When a driver has stopped in accordance with this section, the driver must

(a) cross the railway tracks in a gear that he or she will not need to change while crossing the tracks,

(b) not shift gears while so crossing, and

(c) not stop with a part of the vehicle on or over the tracks.

(6) Despite this Act, the driver of a vehicle approaching the track of a railway must proceed with caution to avoid a collision between the vehicle and an approaching train.

When vehicle stopping prohibited

189 (1) Except when necessary to avoid conflict with traffic or to comply with the law or the directions of a peace officer or traffic control device, a person must not stop, stand or park a vehicle as follows:

(i) within 15 m of the nearest rail of a railway crossing;

Alberta

Highway Traffic Act, R.S.A. 1980, c. H-7.

Railway Crossing

104 (1) At a railway crossing at any time when

(a) a clearly visible electrical or mechanical signal device gives warning of the approach of a railway train,
(b) a crossing gate is lowered or a flagman is giving a signal of the approach or passage of a railway train,
(c) a railway train within approximately 500 metres of the crossing is approaching the crossing and either sounds an audible signal or is visible, or
(d) a railway train is visible and approaching the crossing and by reason of its speed or nearness is an immediate hazard,

a driver approaching the railway crossing

(e) shall stop his vehicle no closer than 5 metres from the nearest rail of the railway, and
(f) shall not proceed until the train
  (i) has passed by the railway crossing, or
  (ii) has come to a stop,

and he can safely proceed.

(2) No person shall drive through, around or under a crossing gate or barrier at a railway crossing while the gate or barrier is closed or is being opened or closed.

(3) If a stop sign is erected at a railway crossing, a driver approaching the railway crossing

(a) shall stop his vehicle
  (i) no closer than 5 metres, and
  (ii) no further than 15 metres,

from the nearest rail of the railway, and

(b) shall not proceed until he can do so safely.

(4) In the case of a railway crossing that is not controlled by a traffic control signal, the driver of a vehicle that

(a) is a school bus,
(b) is carrying explosive substances as cargo, or
(c) is used for carrying inflammable liquids or gas, whether or not it is then empty,

shall stop the vehicle no closer than 5 metres or further than 15 metres from the nearest rail of the railway, and

(d) remaining stopped, shall listen and look in both directions along the railway for an approaching train and for signals indicating the approach of a train,
(e) shall not proceed until he can do so safely, and
(f) in the case of a school bus, shall before proceeding open the front door and if practicable to do so with one hand, shall also open the window immediately to his left.

(5) Subsection (4) does not apply when a peace officer or a flagman otherwise directs.

(6) The council of a city may, by by-law, provide that subsection (4) does not apply to all or any railway crossings in the city.

(7) When a driver has stopped in accordance with this section he

(a) shall cross the railway tracks in a gear that he will not need to change while crossing the tracks, and
(b) shall not shift gears while so crossing.

RSA 1980 cH-7 s104

Punishment

169 (1) Except as otherwise provided in this Act, a person who is guilty of an offence under this Act or the regulations for which a penalty is not otherwise provided is liable to a fine of not more than $500 and in default of payment is liable to imprisonment for a term not exceeding 6 months or to imprisonment for a term not exceeding 6 months without the option of a fine.

Saskatchewan

Highway Traffic Act, S.S. 1986, c.H-3.1

Railway Crossing
Stopping

40 (4) The driver of a vehicle shall bring the vehicle to a stop:

(a) at every place where a stop sign is erected;

(b) when approaching a railway crossing, and a signal person or automatic signal indicates the approach of a train; or

(c) when directed to do so by a school crossing guard patrolling a crosswalk pursuant to subsection 188(4) of The Education Act.

(5) The driver of:

(a) a bus transporting passengers; or

(b) a vehicle that is transporting goods in an amount that requires the vehicle to be placarded pursuant to regulations made pursuant to The Dangerous Goods Transportation Act;

(c) Repealed. 1989-90, c.10, s.9.

shall bring the vehicle to a stop before proceeding over a level railway crossing.

(6) No person who is required to stop pursuant to subsection (4) or (5) shall proceed until it is safe to do so.

(7) Subsection (5) does not apply if an automatic signal is erected at the railway crossing and the signal indicates that it is safe to proceed.

Penalty

General offence and penalty

94 Any person who contravenes any provision of this Act or the regulations for which no other penalty is specifically provided, or who disobeys an order of the board, is guilty of an offence and liable on summary conviction:

(a) in the case of an individual, to a fine of not more than $1,000;

(b) in the case of a corporation, to a fine of not more than $2,000.

1986, c.H-3.1, s.94.

Manitoba
Highway Traffic Act, S.M. 1986, c.3 - Chap.H60

Railway Crossings

134(1) When a driver is approaching a railway crossing

(a) where a "stop" or "arrêt" sign has been erected at the crossing, he shall stop the vehicle

(i) not less than 5 metres from the nearest rail of the railway if the crossing is in a restricted speed area, and

(ii) not less than 15 metres from the nearest rail of the railway if the crossing is not in a restricted speed area,

and he shall not proceed unless he can do so in safety;

(b) when a clearly visible electrical or mechanical traffic control device gives warning of the approach of a railway train, he shall stop the vehicle as required by clause (a) and he shall not proceed while any such signal continues to give warning, unless a peace officer or flagman otherwise directs and he can do so in safety; but where the railway crossing is in a restricted speed area and the train is stopped or not in close proximity to the crossing, the driver may proceed to cross the railway crossing if he can do so in safety;

(c) when a crossing gate is lowered or a flagman is giving a signal of approach or passage of a railway train, or a railway train is in dangerous proximity to the crossing and is giving an audible signal or is visible, he shall stop the vehicle as required by clause (a) and he shall not proceed while the gate is lowered or the flagman continues to give warning of approach of a railway train, unless a peace officer or a flagman otherwise directs and he can do so in safety.

Definition of "flagman"

134(2) In this section and in section 135 "**flagman**" includes a brakeman or other trainman on a train of a railway who, in connection with the operation of a train, is warning people on a highway.

Stops by certain vehicles at railways

135(1) Except as provided in subsections (3) and (4), the driver of

(a) a vehicle carrying passengers for compensation; or
(b) a school bus carrying children; or
(c) a vehicle carrying flammable liquids or gas, whether or not it is empty;

approaching a railway crossing shall stop the vehicle not less than 5 metres, or more than 15 metres, form the nearest rail of the railway, and, with the vehicle stopped, shall

(d) look in both directions along the railway for an approaching train;
(e) listen for signals indicating the approach of a train; and
(f) in the case of a bus or school bus, open the door of the vehicle;

and he shall not proceed unless he can do so in safety.

Crossing railway without changing gear

135(2) Except as provided in subsection (4), where a driver has stopped and is proceeding as required in subsection (1), he shall cross the railway track in a gear that he will not need to change while crossing the track, and he shall not shift gears while crossing.

Where subsection (1) does not apply

135(3) Subsection (1) does not apply where

(a) a peace officer or a flagman directs traffic to proceed; or
(b) the crossing is protected by gates or a railway crossing signal light which are not in operation at the time.

Where subsections (1) and (2) not applicable

135(4) Subsections (1) and (2) do not apply to

(a) street railway grade crossing within a restricted speed area; or
(b) industrial spur railway crossings within a restricted speed area.

Driving through railway barrier

190(2) No person shall drive a vehicle through, around, or under a crossing gate or barrier at a railway crossing while the gate or barrier is closed or is being opened or closed.

General penalty for miscellaneous offences

239 Any person who violates, contravenes, or disobeys or refuses, omits, neglects, or fails to observe, obey, or comply with

(a) any provision of this Act or of the regulations; or
(b) any municipal by-law duly passed under the authority of this Act; or
(c) any order of a peace officer, other than an order of a peace officer under section 76.1, any order of a traffic authority, the traffic board, the transport board, or other authority or person, lawfully given by him or it under this Act, or indicated or conveyed by a traffic control device;

is guilty of an offence and, unless another penalty is prescribed therefor herein or in any such by-law or regulation, is liable, on summary conviction, to a fine of not more than $500 and to suspension of licence for a term of not more than 30 days.

S.M. 1989 90, C.4, S.6; SM 1996, C.26, S.17.

Ontario
Highway Traffic Act, R.S.O. 1990, c. H.8.

Amended by: S.O. 1992, c. 20, s. 2; S.O. 1993, c. 8; S.O. 1993, c. 13, s. 1; S.O. 1993, c. 18; S.O. 1993, c. 7, Sched.; S.O. 1993, c. 31, s. 2; S.O. 1993, c. 34, S.O. 1993, c. 40; S.O. 1994, c. 27, s. 138; S.O. 1994, c. 28; S.O. 1994, c. 29; S.O. 1994, c. 35; S.O. 1996, c. 1, Sched. E, s. 2; S.O. 1996, c. 9, s. 26; S.O. 1996, c. 20, ss. 1, 2, 3, 5, 7-10, 13-21, 23-30; S.O. 1996, c. 32, s. 71; S.O. 1996, c. 33, ss. 1-11, 13-17; S.O. 1997, c. 12; S.O. 1996, c. 31, ss. 68-70; S.O. 1997, c. 4, s. 81; S.O. 1997, c. 26, Sched.; S.O. 1998, c. 5, ss. 25-27; S.O. 1998, c. 6; S.O. 1997, c. 41, s. 120; S.O. 1998, c. 35, s. 103; S.O. 1998, c. 18, Sched. G, s. 56; S.O. 1998, c. 28, s. 67; S.O. 2000, c. 38, ss. 1(1), (2), 2(1), (2), 3(1), 4, 5(1), (2), 6; S.O. 1999, c. 12, Sched. B, s. 9, Sched. R, s. 3; S.O. 1999, c. 13; S.O. 1999, c. 8, s. 7; S.O. 1999, c. 12, Sched. G, s. 24; S.O. 2000, c. 15, s. 1.

Vehicles required to stop at railway crossing signal

163. When the driver of a vehicle is approaching a railway crossing at a time when a clearly visible electrical or mechanical signal device or a flagman is giving warning of the approach of a railway train, he or she shall stop the vehicle not less than 5 metres from the nearest rail of the railway and shall not proceed until he or she can do so safely. R.S.O. 1990, c. H.8, s. 163.

Driving of vehicles under crossing gates prohibited

164. No person shall drive a vehicle through, around or under a crossing gate or barrier at a railway crossing while the gate or barrier is closed or is being opened or closed. R.S.O. 1990, c. H.8, s. 164.

Public vehicles required to stop at railway crossings

174. (1) The driver of a public vehicle upon approaching on a highway a railway crossing that is not protected by gates or railway crossing signal lights, unless otherwise directed by a flagman, shall,

(a) stop the vehicle not less than 5 metres from the nearest rail of the railway;
(b) look in both directions along the railway track;
(c) open a door of the vehicle and listen to determine if any train is approaching;
(d) when it is safe to do so, cross the railway track in a gear that will not need to be changed while crossing the track; and
(e) not change gears while crossing the railway track.

School buses required to stop at railway crossings

(2) The driver of a school bus, within the meaning of section 175, upon approaching on a highway a railway crossing, whether or not it is protected by gates or railway crossing signal lights, unless otherwise directed by a flagman, shall,

(a) stop the school bus not less than 5 metres from the nearest rail of the railway;
(b) look in both directions along the railway track;
(c) open a door of the school bus and listen to determine if any train is approaching;
(d) when it is safe to do so, cross the railway track in a gear that will not need to be changed while crossing the track; and
(e) not change gears while crossing the railway track. 1997, c. 12, s. 13.

General penalty

214. (1) Every person who contravenes this Act or any regulation is guilty of an offence and on conviction, where a penalty for the contravention is not otherwise provided for herein, is liable to a fine of not less than $60 and not more than $500.

Penalty for other offences in community safety zone

(8) Every person who commits an offence in contravention of any of sections 132 to 164, inclusive (except subsections 140(4) and (6) and subsections 144(22) to (29), inclusive), section 166, 167, 168 or 169, subsection 176(3) or section 182 in a community safety zone when it is in effect is liable, on conviction, not to the penalty otherwise applicable, but to a fine of not less than double the minimum fine otherwise applicable and not more than the maximum fine otherwise applicable.

Quebec

Highway Safety Code L.R.Q. 2000, c. C-24.2.

Level Crossing

Failure to come to a mandatory stop at a level crossing – 3 demerit points

Failure to stop at a level crossing when driving a bus, a minibus or a road vehicle equipped for the transport of dangerous substances, OR setting such a vehicle in motion again when prohibited – 9 demerit points

Prohibited stopping

386. Except in cases of necessity or where another provision of this Code permits it, no person may stop a road vehicle

(4) at an intersection, on a pedestrian crosswalk clearly identified as such and on a level crossing or less than 5 metres therefrom;

1986, c. 91, s. 386; 1987, c. 94, s. 57; 1990, c. 83, s. 150; 1993, c. 42, s. 7.

Level crossing

411. At a level crossing, the driver of a road vehicle or any person riding a bicycle must stop his vehicle not less than 5 metres from the railway where a sign or signal, a lowered gate or a railway employee signals an approaching rail vehicle, or where the driver or cyclist sees or hears a rail vehicle approaching the level crossing.

1986, c. 91, s. 411.

Insufficient space

412. Even if so authorized by traffic lights, no driver of a road vehicle may enter a level crossing if there is not sufficient space ahead of the vehicle to allow him to cross the level crossing.

1986, c. 91, s. 412.

Level crossing

413. The driver of a bus, minibus or road vehicle carrying certain categories of dangerous substances determined by regulation must stop his vehicle not less than 5 metres from any level crossing. The driver may then proceed only after ascertaining that he may do so in safety.

Exemption

The driver is exempt from the obligations under the first paragraph at level crossings where so indicated by a sign or signal.

1986, c. 91, s. 413.

Exemption

414. The Minister of Transport may, by an order published in the *Gazette officielle du Québec*, designate certain level crossings where the driver of a road vehicle referred to in section 413 is exempt from the obligations under the said section.

1986, c. 91, s. 414.

Offence and penalty

506. Every person who contravenes section 324, the second paragraph of section 325, any of sections 336, 339, 351 to 358, 366, 372 to 376, 381 to 385, paragraphs 1 to 7, 8 and 9 of section 386, section 387, the third paragraph of section 407, any of sections 412, 417, 426 to 436, 439, 440, 442, 480 to 482, 493 and 499 and every person other than a person riding a bicycle who contravenes section 477 is guilty of an offence and is liable to a fine of $30 to $60.

509. Every person who contravenes any of sections 320, 322, 326, 331, 335, 365, paragraph 7.1 of section 386, section 388 or section 391, the first paragraph of section 407, any of sections 415, 416, 417.1, 418, 421.1, 473.1, 483 and 502, and every person other than a person riding a bicycle who contravenes any of sections 349,350, 359, 360, 362 to 364, 367, to 371, 404, 405, 408 to 411, 421, 478 and 479 is guilty of an offence and is liable to a fine of $100 to $200.

Level crossing

519.13. A driver of a heavy vehicle must, unless exempted from doing so by regulation or by a sign or signal, stop the heavy vehicle at least five metres from any level crossing and then proceed only after ascertaining that it is safe to proceed.

Exceptions

The Minister of Transport may, by order published in the *Gazette officielle du Québec*, designate certain level crossings at which the driver of a heavy vehicle is not required to stop.

1987, c. 94, s. 70; 1990, c. 83, s. 200; 1998, c. 40, s. 119.

Regulations

621. The Government may by regulation

(42.1) exempt certain heavy vehicles from the obligation of stopping at a level crossing;

New Brunswick
Motor Vehicle Act, R.S.N.B. 1986, c. M-17

182(1) Any person driving a vehicle approaching a railroad grade crossing shall stop such vehicle within fifteen metres, but not less than five metres from the nearest rail of such railroad, when

(a) a clearly visible electric or mechanical signal device, designed to give warning of the approach of a railroad train, is exhibiting a warning signal,

(b) a crossing gate is lowered or when a human flagman gives or continues to give a signal of the approach of a railroad train,

(c) a railroad train approaching within approximately five hundred metres of the highway crossing emits a signal audible from such distance and such railroad train, by reason of its speed or nearness to such crossing, is an immediate hazard, or

(d) an approaching railroad train is plainly visible and is in hazardous proximity to such crossing

and shall not thereafter cross over the railroad track or tracks until the imminent danger from traffic on the railroad has ceased to exist.

182(2) No person shall drive any vehicle through, around, or under any crossing gate or barrier at a railroad crossing while such gate or barrier is closed or is being opened or closed. 1955, c.13, s.165; 1961-62, c.62, s.61; 1977, c.M-11.1, s.17(q)(r).

183(1) The following may cause stop signs to be erected at railway crossings:

(a) local authorities, within their jurisdictions;

(b) the New Brunswick Highway Corporation, with respect to railway crossings at highways under its administration and control; and

(c) the Minister, with respect to railway crossings at all other highways, including, without limiting the generality of the foregoing, those under the administration and control of a project company.

183(2) No such stop sign shall be erected by a local authority without the approval of the Lieutenant-Governor in Council.

183(3) The driver of a vehicle that is approaching a railway crossing at which a stop sign has been erected shall stop the vehicle within fifteen metres, but not less than five metres, from the nearest rail of the railway and shall not proceed until it is safe to do so. 1955, c.13, s.166; 1961-62, c.62, s.62; 1977, c.M-11.1, s.17; 1978, c.D-11.2, s.26; 1994, c.31, s.14; 1995, c.N-5.11, s.44; 1997, c.62, s.10.

184(1) The driver of any motor vehicle carrying passengers for hire, or of any bus, or of any vehicle carrying explosive substances or flammable liquids as a cargo or part of a cargo, before crossing at grade any tracks of a railroad, shall stop such vehicle within fifteen metres, but not less than five metres from the nearest rail of such railroad and while so stopped shall listen and look in both directions along such tracks for any approaching train, and for signals indicating the approach of a train, and shall not proceed until he can do so safely.

184(2) After stopping as required by subsection (1), and upon proceeding when it is safe to do so, the driver of any such vehicle shall cross with the vehicle so geared that there will be no necessity for changing gears while traversing such crossing and the driver shall not shift gears while crossing the track or tracks.

184(3) No stop need be made at any such crossing where a police officer or a traffic control signal directs traffic to proceed. 1955, c.13, s.167; 1977, c.M-11.1, s.17(t); 1983, c.52, s.13.

185(1) No person shall operate or move any crawler-type tractor, steam shovel, derrick, roller, or any equipment or structure having a normal operating speed of twenty or less kilometres per hour or a vertical body or load clearance of less than four centimetres for each metre of the distance between any two adjacent axles or in any event of less than twenty centimetres measured above the level surface of a roadway, upon or across any tracks at a railroad grade crossing without first complying with this section.

185(2) Notice of any such intended crossing shall be given to the railway agent of such railroad and a reasonable time shall be given to such railroad to provide proper protection at such crossing.

185(3) Before making any such crossing the person operating or moving any such vehicle or equipment shall first stop the same not less than five metres nor more than fifteen metres from the nearest rail of such railroad and while so stopped shall listen and look in both directions along such track for any approaching train and for signals indicating the approach of a train, and shall not proceed until the crossing can be made safely.

185(4) No such crossing shall be made when warning is given by automatic signal or crossing gates or a flagman or otherwise of the immediate approach of a railroad train or car, and if a flagman is provided by the railroad, movement over the crossing shall be under his direction. 1955, c.13, s.168; 1977, c.M-11.1, s.17(u).

Nova Scotia

Motor Vehicle Act, R.S.N.S. 1989, c. 293

amended 1990, c. 36; 1993, cc. 30, 31; 1994, cc. 25, 24; 1994-95, c. 6, s. 65; 1994-95, c. 12; 1995-96, cc. 20, 22, 23; 1996, cc. 34, 35; 1997, c. 5

Offence not to stop at railway crossing

132 (1) Whenever a person driving a vehicle approaches a highway and railway grade crossing and a clearly visible or positive signal gives warning of the immediate approach of a railway engine, train or car, it shall be an offence for the driver of the vehicle to fail to stop the vehicle before traversing such grade crossing.

Condition for entry of crossing

(2) No driver shall enter a highway and railway grade crossing unless there is sufficient space on the other side to accommodate the vehicle he is operating without obstructing the passage of railroad trains. R.S., c. 293, s. 132.

Offence to stop or park

143 It shall be an offence for the driver of a vehicle to stop, stand or park the vehicle, whether attended or unattended, except when necessary to avoid conflict with other traffic or in compliance with the directions of a peace officer or traffic control signal or sign, in any of the following places:

(m) within 15 metres of the nearest rail of a railway crossing;

Offence and minimum penalty of $15

292 Any person who violates any of the provisions of Section 18, 24, 28, 30, 34, 58 or 61, subsection (3) of Section 71, subsection (2) of Section 78, Section 95, 99, 126, 138, 139, 140, 143, 144, 146, 148, 149, 151, 155 or 156, subsection (1) of Section 158, or Section 159, 160, 166, 177, 179, 183, 187 or 202 shall be guilty of an offence and shall be liable for the first offence to a penalty of not less than fifteen dollars and in default of payment, to imprisonment for a term not less than seven days, for the second offence to a penalty of not less than twenty-five dollars and in default of payment, to imprisonment for a term not less than seven days, and for the third or any subsequent offence to a penalty of not less than fifty dollars and in default of payment to imprisonment for a term not less than seven days. R.S., c. 293, s. 292.

Offence and minimum penalty of $25

293 (1) Any person who violates any of the provisions of Section 38, 40, 65, 69, 70, 70A, 70B, 76 or 82, subsection (2) of Section 83, Section 93, 108, 113, 118, 119, 120, 122, 123, 124, 131, 132, 133, 134, subsection (1) of Section 136, 161, 162, 165, 169, 170, 174, 178, 181, 184, 185, 186, 189, 198, 201 or 301 shall be guilty of an offence and shall be liable for the first offence to a penalty of not less than twenty-five dollars and in default of payment, to imprisonment for a term not less than seven days, for the second offence to a penalty of not less than fifty dollars, and in default of payment, to imprisonment for a term not less than fourteen days, and for the third or subsequent offence to a penalty of not less than one hundred dollars or in default of payment, to imprisonment for a term not less than thirty days.

Canada
Railway Safety Act, R.S.C. 1985, c. 32 (4th Supp.)

OPERATION AND MAINTENANCE OF RAILWAY WORKS AND EQUIPMENT

Regulations

18. (1) The Governor in Council may make regulations

(a) respecting the operation or maintenance of line works, and the design, construction, alteration, operation and maintenance of railway equipment, which regulations may embrace, among other things, performance standards;

(b) declaring positions in railway companies to be critical to safe railway operations;

(c) respecting the following matters, in so far as they relate to safe railway operations, in relation to persons employed in positions referred to in paragraph (b):

(i) the training of those persons, both before and after appointment to those positions,

(ii) hours of work and rest periods to be observed by those persons,

(iii) minimum medical, including audiometric and optometric, standards to be met by those persons,

(iv) the control or prohibition of the consumption of alcoholic beverages and the use of drugs by those persons, and

(v) the establishment of support programs for those persons and standards applicable to such programs; and

(d) respecting the establishment of a scheme for licensing persons employed in positions referred to in paragraph (b), and prescribing the fees for the licences.

Regulations - crossing works

(2) The Governor in Council may make regulations respecting crossing works, including regulations for requiring a railway company, road authority or other person who has rights relating to a road crossing to conduct a safety review of the road crossing following an accident of a type specified in the regulations.

Regulations - security

(2.1) The Governor in Council may make regulations respecting the security of railway transportation.

Regulations to override rules

(3) If the Governor in Council at any time makes regulations respecting a matter referred to in subsection (1) or (2.1) that are inconsistent with rules approved in relation to a particular company by the Minister under section 19 or 20 in respect of that matter, those rules are at that time revoked to the extent of the inconsistency.

R.S., 1985, c. 32 (4th supp), s. 18; 1999, c. 9, s. 12

Rules

Formulation or revision of rules pursuant to ministerial order

19. (1) The Minister may, by order, require a railway company

(a) to formulate rules respecting any matter referred to in subsection 18(1) or (2.1) or to revise its rules respecting that matter; and

(b) within a specified period, to file the formulated or revised rules with the Minister for approval.

Railway company to consult

(2) A railway company shall not file rules with the Minister under subsection (1) unless it has first given each relevant association or organization that is likely to be affected by their implementation a reasonable opportunity during a period of sixty days to consult with it on the rules.

Notice to accompany rules

(3) Where rules are filed with the Minister by a railway company pursuant to an order under subsection (1) notwithstanding that a relevant association or organization objects, on the grounds of safety, to the implementation of those rules, the railway company shall, by notice filed with those rules, identify the association or organization and attach a copy of the notice of objection.

Consideration of rules

(4) Where rules are filed with the Minister by a railway company pursuant to an order under subsection (1), the Minister shall forthwith consider whether, in the Minister's opinion and after having regard to current railway practice, to the views of the railway

company and the views of any relevant association or organization identified under subsection (3) and to any other factor that the Minister considers relevant, those rules are conducive to safe railway operations by the company, and, before the expiration of the assessment period in relation to those rules,

(a) if the Minister is satisfied that the rules are conducive to those operations, notify the company and each association or organization identified under subsection (3) that the Minister approves those rules, either absolutely or on such terms and conditions as are specified in the notice; or

(b) if the Minister is not satisfied that the rules are conducive to those operations, notify the company and each association or organization identified under subsection (3) that the Minister refuses to approve those rules and of the reasons why the Minister is not so satisfied.

Request for amendment to terms and conditions

(4.1) A railway company referred to in subsection (4) may request the Minister to amend any terms or conditions specified under that subsection. When making that request, the company shall send a copy of the request to each relevant association or organization.

Amendments

(4.2) After receiving a request from a railway company under subsection (4.1), the Minister may, on the basis of new information about the safety of the railway operations, amend any terms or conditions specified under subsection (4). If the Minister amends any of those terms or conditions, the Minister shall provide each relevant association or organization with a copy of the amendments.

Minister may seek advice

(5) The Minister may, in deciding whether to approve rules filed by a railway company, engage any person or organization having expertise in matters relating to safe railway operations to furnish advice in relation to the matter.

Effective date of rules

(5.1) Rules approved by the Minister under subsection (4) come into force on a day specified by the Minister, but if they replace any regulations, they may not come into force earlier than the day on which the regulations are repealed.

Revision of rules

(6) Where a railway company files rules in respect of a matter pursuant to an order under subsection (1) and the Minister notifies the company that the Minister refuses to approve those rules,

(a) the company may, unless the Minister indicates in that notice an intention to establish rules in respect of that matter under subsection (7), formulate and file with the Minister for approval further rules in respect of that matter as if the order made pursuant to subsection (1) in respect of that matter had been made on the date of receipt by the company of the notice of refusal; and

(b) the provisions of this section apply in relation to those further rules, with such modifications as the circumstances require.

Failure to file rules

(7) Where

(a) a railway company fails to file rules pursuant to an order under subsection (1), or

(b) a railway company files rules pursuant to an order under subsection (1) but the Minister refuses under subsection (4) to approve those rules,

the Minister may, by order, establish rules in respect of the matter in relation to that company.

Consultation

(8) The Minister shall not, under this section, establish rules applying to a particular railway company unless the Minister has

(a) given that company and each relevant association or organization a reasonable opportunity during a period of sixty days to consult with the Minister on the rules; and

(b) considered any objection, on the grounds of safety, to the establishment of the rules that is made in the course of that consultation.

Rules established by Minister

(9) Rules established by the Minister under subsection (7) in relation to a railway company have the same effect as if they had been formulated by the company and approved by the Minister under subsection (4).

Definition of "assessment period"

(10) In this section, "assessment period", in relation to rules filed with the Minister under this section, means

(a) the period of sixty days commencing on the day on which the rules are filed; or

(b) if, before the expiration of the period mentioned in paragraph (a), the Minister determines that, by reason of the complexity of the rules, the number of rules filed or any other reason, it will not be feasible to consider the rules before the expiration of that period, and so notifies the railway company concerned, such period in excess of that period of sixty days as the Minister specifies in the notice.

Period of inquiry not part of assessment period

(11) Where, pursuant to section 40, the Minister directs persons to conduct an inquiry respecting proposed rules, the period commencing on the day when the Minister so directs and ending on the day when the persons report back to the Minister pursuant to section 40 shall be disregarded in computing the assessment period.

R.S., 1985, c. 32 (4th Supp.), s. 19; 1999, c. 9, s. 13.

Formulation or revision of rules

20. (1) A railway company shall file with the Minister for approval any rules in respect of any matter referred to in subsection 18(1) or (2.1) that it proposes to formulate or revise on its own initiative.

Consultation

(2) A railway company shall not file rules with the Minister under subsection (1) unless it has first given each relevant association or organization that is likely to be affected by their implementation a reasonable opportunity during a period of sixty days to consult with it concerning the rules.

Rules to be accompanied by notice

(3) Rules filed with the Minister by a railway company pursuant to subsection (1) shall be accompanied by a notice

(a) setting out the reasons why the railway company proposes to formulate or revise the rules; and

(b) if a relevant association or organization objects, on the grounds of safety, to the implementation of those rules, identifying the association or organization and attaching a copy of the notice of objection.

Application of certain provisions

(4) Subsections 19(4) to (5.1), (10) and (11) apply in relation to the filing and consideration of rules filed with the Minister under subsection (1) as if the rules had been duly filed in compliance with an order made under subsection 19(1).

R.S., 1985, c. 32 (4th Supp.), s. 20; 1999, c. 9, s. 14.

Miscellaneous Provisions Relating to Regulations and Rules under this Part

Uniformity of rules

21. In establishing, under section 19 or 20, rules applying to a particular railway company or in deciding, under section 19 or 20, whether to approve rules formulated or revised by, and applying to, a particular railway company, the Minister shall, to the extent that it is, in the opinion of the Minister, reasonable and practicable to do so, ensure that those rules are uniform with rules dealing with a like matter and applying to other railway companies.

Exemption by order in council

22. (1) The Governor in Council may, by order, on any terms and conditions that are specified in the order,

(a) exempt a specified railway company, specified railway equipment or a specified railway work from the application of a specified provision of regulations made under subsection 18(1) or (2.1) or of rules in force under section 19 or 20; or

(b) exempt a specified person from the application of a specified provision of regulations made under subsection 18(2).

Exemption by Minister

(2) The Minister may, by notice, on any terms and conditions that are specified in the notice,

(a) exempt a specified railway company, specified railway equipment or a specified railway work from the application of a specified provision of regulations made under subsection 18(1) or (2.1) or of rules in force under section 19 or 20, or

(b) exempt a specified person from the application of a specified provision of regulations made under subsection 18(2)

if, in the opinion of the Minister, the exemption is in the public interest and is not likely to threaten safe railway operations.

Sending of notices

(3) A notice under subsection (2) shall be sent to the railway company or person exempted by the notice and takes effect on receipt by that company or person.

Application

(4) A railway company may apply to the Minister for an exemption from the application of a specified provision of regulations under subsection 18(1), (2) or (2.1) or of rules in force under section 19 or 20.

Railway company to consult

(5) A railway company may not apply for an exemption under subsection (4) unless it has first given each relevant association or organization that is likely to be affected by the exemption a reasonable opportunity during a period of sixty days to consult with it, except that it may apply for the exemption before the end of those sixty days if it has consulted with all those associations and organizations.

Copy of comments

(6) The railway company shall send with its application to the Minister a copy of all comments received from relevant associations and organizations.

Period for granting application

(7) The Minister may grant the application within sixty days after receiving it if, in the opinion of the Minister, the exemption is in the public interest and is not likely to threaten safe railway operations. The Minister may extend the time for granting the application for an additional period of up to sixty days.

R.S., 1985, c. 32 (4th Supp.), s. 22; 1999, c. 9, s. 15.

Other exemptions

22.1 (1) A railway company that proposes to conduct testing relating to rail transportation, or that requires an immediate exemption of short duration, is exempt from the application of any provision of standards formulated under section 7, regulations made under subsection 18(1) or (2) or 24(1) or rules in force under section 19 or 20 during any period that the company considers necessary. However, the exemption is effective only if the railway company files a notice of the exemption with the Minister and each relevant association or organization that is likely to be affected by the exemption and

> (a) within twenty-one days after filing the notice, the company receives a response from the Minister and each of those associations and organizations indicating that they do not object to the exemption; or
>
> (b) no objections are confirmed or made by the Minister under subsection (3).

Objections

(2) Each of the relevant associations or organizations may object to the exemption on the grounds of safety. The objection must be filed with the Minister and the railway company within fourteen days after the notice referred to in subsection (1) is filed.

Minister's decision

(3) The Minister may

(a) within seven days after the filing of an objection under subsection (2), confirm the objection if the Minister decides that the exemption threatens safety; or

(b) within twenty-one days after receiving the notice under subsection (1), object to the exemption if the Minister is of the opinion that the exemption is not in the public interest or that it is likely to threaten safety.

1999, c. 9, s. 16.

Operation and Maintenance of Railway Works to Accord with Regulations and Rules

Company not to operate or maintain a railway otherwise than in accordance with regulations or rules

23. (1) Unless a railway company is exempted under section 22 or 22.1 from the application of regulations made under section 18 or of rules in force under section 19 or 20 that would otherwise apply to that company, the company shall not operate or maintain railway works or railway equipment otherwise than in accordance with those regulations or rules.

Person not to maintain crossing work other than in accordance with regulations

(2) Unless the person responsible for the maintenance of a crossing work is exempted under section 22 or 22.1 from the application of regulations made under section 18 in relation to the maintenance of that crossing work, that person shall not maintain that crossing work otherwise than in accordance with those regulations.

R.S., 1985, c. 32 (4th Supp.), s. 23; 1999, c. 9, s. 17.

Audible Warnings

Use of whistles

23.1 (1) No person shall use the whistle on any railway equipment in an area within a municipality if

(a) the area meets the requirements prescribed for the purposes of this section; and

(b) the government of the municipality by resolution declares that it agrees that such whistles should not be used in that area and has, before passing the resolution,

(i) consulted the railway company that operates the relevant line of railway,

(ii) notified each relevant association or organization, and

(iii) given public notice of its intention to pass the resolution.

Ministerial decision

(2) The Minister may decide whether the area meets the prescribed requirements and the Minister's decision is final.

Exceptions

(3) Despite subsection (1), the whistle may be used if

(a) there is an emergency;

(b) any rules in force under section 19 or 20 require its use; or

(c) a railway safety inspector orders its use under section 31.

1999, c. 9, s. 18.

PART III

NON-RAILWAY OPERATIONS AFFECTING RAILWAY SAFETY

Regulations

24. (1) The Governor in Council may make regulations

(a) respecting

(i) the control or prohibition of the construction or alteration, or

(ii) the control of the maintenance

of buildings and other structures, not being railway works, erected or proposed to be erected above or below a line of railway, or on land adjoining the land on *which the line is situated*, to the extent only that is necessary to prevent those buildings or structures from constituting a threat to safe railway operations;

(b) respecting the control or prohibition of the construction, alteration or operation of any mine or other works, not being railway works, constructed or proposed to be constructed below or on land adjoining the land on which a line of railway is situated, to the extent only that is necessary to prevent those mines or works from constituting a threat to safe railway operations;

(c) respecting

(i) the control or prohibition of the construction or alteration, and

(ii) the control of the maintenance,

on land adjoining the land on which a line of railway is situated, of drainage systems that would constitute a threat to safe railway operations;

(d) respecting the control or prohibition of the presence or storage, on land adjoining the land on which a line of railway is situated, of specified materials;

(e) respecting

(i) the removal of anything, including trees or brush, that might, by obscuring clear vision either of a road or of a line of railway, constitute a threat to safe railway operations,

(ii) the removal of weeds that are on or along lines of railway, and

(iii) the use of alternatives to chemical pesticides under subparagraphs (i) and (ii);

(f) for restricting or preventing, by means of fences, signs or any other means, access to the land on which a line of railway is situated by persons, other than servants or agents of the railway company concerned, by vehicles, or by animals, where the presence of persons, vehicles or animals on that land would constitute a threat to safe railway operations;

(f.1) respecting the construction, alteration and maintenance of roads for the purpose of ensuring safe railway operations;

(f.2) respecting the control of vehicular and pedestrian traffic on road approaches to road crossings for the purpose of ensuring safe railway operations; and

(g) respecting the control or prohibition of any other activity, on land adjoining the land on which a line of railway is situated, that could constitute a threat to safe railway operations.

Exemption by Minister

(1.1) The Minister may, on any terms and conditions that the Minister considers necessary, exempt any railway company or other person from the application of any regulation made under subsection (1) if, in the opinion of the Minister, the exemption is in the public interest and is not likely to threaten safety.

Compensation

(2) Where the owner, lessee or occupier of land adjoining the land on which a line of railway is situated, the owner, lessee or occupier of any building or other structure erected on that adjoining land, or the owner of any mine or other works operated on that adjoining land, suffers a loss by reason of the operation of the regulations made under this section, the railway company operating that line of railway shall pay to that person such compensation in respect of that loss as is agreed to between the railway company and that person or, failing such agreement, as is determined pursuant to section 26.

R.S., 1985, c. 32 (4th Supp.), s. 24; 1994, c. 15, s. 1(F); 1999, c. 9, s. 19.

Offences

Contravention of provision of Act

41. (1) Every person who contravenes a provision of this Act is guilty of an offence and liable

(a) on conviction on indictment,

(i) in the case of a corporation, to a fine not exceeding two hundred thousand dollars, and

(ii) in the case of an individual, to a fine not exceeding ten thousand dollars or to imprisonment for a term not exceeding one year, or to both; or

(b) on summary conviction,

(i) in the case of a corporation, to a fine not exceeding one hundred thousand dollars, and

(ii) in the case of an individual, to a fine not exceeding five thousand dollars or to imprisonment for a term not exceeding six months, or to both.

Contravention of regulations, orders, etc.

(2) A person is guilty of an offence if the person contravenes

(a) a regulation made under subsection 7(1) or section 7.1, 18, 24, 37, 47 or 47.1;

(b) an order made by the Minister or a railway safety inspector under subsection 7(2) or 19(1) or section 31 or 32;

(c) a requirement made by the Agency under subsection 16(3) or 26(3);

(d) a rule in force under section 19 or 20;

(e) an emergency directive made by the Minister under section 33; or

(f) a requirement under subsection 39.1(2) to carry out a security measure.

Punishment

(2.1) A person who is guilty of an offence under subsection (2) is liable on summary conviction

(a) in the case of a corporation, to a fine of not more than $100,000; and

(b) in the case of an individual, to a fine of not more than $5,000 or to imprisonment for a term of not more than six months, or to both.

Continuing offences

(3) If a person commits a contravention described in subsection (1) or (2) that occurs on more than one day, or is continued for more than one day, the person is deemed to have committed a separate offence for each day on which it occurs or is continued.

Contraventions Regulations

Contraventions Regulations, S.O.R./96 – 313.

P.C. 1996-915 20 June, 1996

SCHEDULE I.01 (Sections 1 to 3)

PART I

CANADA PORTS CORPORATION OPERATING BY-LAW

Item	Provision of *Canada Ports Corporation Operating By-law*	Short-Form Description	Fine ($)
22.	42(b)	Operate vehicle between railway tracks	50
23.	42(c)	Operate vehicle across railway tracks	50

SOR/97-469, s. 2; SOR/2000-381, s. 1.

SCHEDULE X

(Sections 1 to 3)

RAILWAY SAFETY ACT

Item	Provision of R.S.A.	Short-Form Description	Fine ($)
1.	26.1	Enter on land on which a line work is situated	100

SOR/98-253, s. 1.

APPENDIX B

MOTOR CARRIER SAFETY ASSESSMENT THRESHOLD FORMULA

THE EXAMPLE OF ONTARIO AND ITS COMMERCIAL VEHICLE OPERATOR'S REGISTRATION (CVOR) SYSTEM

ACCIDENT THRESHOLD

An accident threshold value is determined for each carrier, based on its adjusted fleet size. Carriers with the same adjusted fleet size will therefore have the same accident threshold. The accident violation rates of a large sample of carriers were analysed and a threshold curve was established that identifies those carriers with unacceptably high accident rates relative to other carriers of similar fleet size.

The accident threshold formula is:

	for Fleet Size 1-25	**for Fleet Size 26+**
Accident Threshold	$T_a = 0.2226 f^{-0.5000}$	$T_a = 0.0436$

Where: T_a = accident points / vehicle / month
f = adjusted fleet size

For ease of calculation, accident threshold values have been calculated and presented in a "look-up" table contained in *Ontario's Carrier Safety Rating and Commercial Vehicle Operator's Registration System – Public Guideline, 2000* published by the Ontario Ministry of Transportation.

CONVICTION THRESHOLD

A conviction threshold value is determined for each carrier, based on its adjusted fleet size. Carriers with the same adjusted fleet size will therefore have the same conviction threshold. The conviction violation rates of a large sample of carriers were analysed and a threshold curve was established that identifies those carriers with unacceptably high conviction rates relative to other carriers of similar fleet size.

The conviction threshold formula is:

	for Fleet Size 1-25	**for Fleet Size 26+**
Conviction Threshold	$T_c = 1.0452 f^{-0.5663}$	$T_c = 0.1652$

Where: T_c = conviction points / vehicle / month
f = adjusted fleet size

For ease of calculation, conviction threshold values have been calculated and presented in a Table format contained in *Ontario's Carrier Safety Rating and Commercial Vehicle Operator's Registration System – Public Guideline, 2000* published by the Ontario Ministry of Transportation.

INSPECTION THRESHOLD

An inspection threshold value is determined for each carrier, based on its frequency of vehicle inspections. Carriers with the same number of vehicle units inspected will therefore have the same inspection threshold. The inspection violation rates of a large sample of carriers were analysed and a threshold curve was established that identifies those carriers with unacceptably high CVSA inspection "out-of-service" rates relative to other carriers with a similar number of vehicle units inspected.

The inspection threshold formula is (for both small and large carriers):

Inspection Threshold $T_i = 5.3841\ v^{-0.4350}$

Where: T_i = inspection points / # of vehicle units inspected
v = # of vehicle units inspected in the analysis period

CVOR Calculations

How is the adjusted fleet size calculated?

The following three steps are used to establish the adjusted fleet size of a carrier that is used to determine the carrier's accident and conviction violation rates and thresholds. This calculation incorporates the percentage of travel in Ontario and double-shifting.

1. To calculate the total number of commercial motor vehicles operated in Ontario (include only those vehicles operated in Ontario):
   Vehicle power units owned *plus*
   Vehicle power units leased/rented *plus*
   Owner/Operators under CVOR *plus*
   Number of those commercial motor vehicles double-shifted *equals*
   Total vehicles operated in Ontario.

   For example:

   Bob owns 10 highway tractors and leases 5 trucks. He also employs 5 Owner/Operators. The tractors (10) are driven by teams and are therefore double-shifted.

   Therefore, Bob's total number of commercial motor vehicles is:

   10 + 5 + 5 + 10 = 30 total commercial motor vehicles.

2. To calculate the percentage of travel in Ontario:
   Total kilometres travelled in Ontario by those vehicles operating in Ontario *divided by*
   Total kilometres travelled by those vehicles operating in Ontario *multiplied by* 100 *equals*
   Percentage of travel in Ontario.

   For example:

   Bob's fleet travels approximately 500,000 km per year, of which 400,000 are within Ontario.

Therefore, Bob's percentage of travel is:

(400,000 ÷ 500,000) x 100 = 80% travel in Ontario.

3. To calculate the adjusted fleet size:
Total commercial motor vehicles operated in Ontario *multiplied by*
Percentage of travel in Ontario *equals*
Adjusted fleet size (rounded up).

For example:

Bob's total number of commercial motor vehicles operated in Ontario is 30 and the percentage of travel of these vehicles in Ontario is 80%.

Therefore, Bob's adjusted fleet size is:

30 x 80% = 24.

How are the Accident Violation Rate and Percentage of Threshold calculated?

Using the data collected from police accident reports, accident demerit points are assigned according to the accident weighting table.

An accident is considered to have impropriety if the accident report indicates something other than "normal" under vehicle condition (fields 31and 32), driver action (fields 33 and 34) or driver condition (fields 35 and 36). See the Motor Vehicle Accident Report and Template in *Ontario's Carrier Safety Rating and Commercial Vehicle Operator's Registration System – Public Guideline, 2000* published by the Ontario Ministry of Transportation for more details.

For example:

A carrier with an adjusted fleet size of 2 vehicles had the following 3 accidents in the past 24-month period *(note: the 24-month period does not include the most recent 30 days)*:

- 1 involving property damage and no impropriety (0 points);
- 1 involving personal injury and impropriety/charges (8 points);
- 1 involving a fatality and no impropriety (0 points).

The Accident Violation Rate would be calculated in the following manner:

Step 1

Calculate the total accident points:

0 + 8 + 0 = 8 (total accident points).

Step 2

Divide the total accident points by the number of vehicles operated:

8 ÷ 2 = 4 (total points per vehicle).

Step 3

Divide the number of points per vehicle by the number of months operated:

4 ÷ 24 = 0.1667 (points per vehicle per month).

Step 4

Consult the Table of Threshold Values in *Ontario's Carrier Safety Rating and Commercial Vehicle Operator's Registration System – Public Guideline, 2000* published by the Ontario Ministry of Transportation to determine the accident threshold for a carrier with a fleet size of 2. The accident threshold value for an adjusted fleet size of 2 is 0.1574.

Step 5

Calculate the percentage of threshold by dividing the points per vehicle per month by the accident threshold value in the table and multiplying the result by 100:

(0.1667 ÷ 0.1574) x 100 = 105.9% (% of accident threshold = P_a).

In other words, this carrier's accident violation rate is 5.9% above the accident threshold for a carrier with an adjusted fleet size of 2 vehicles.

How are the Conviction Violation Rate and Percentage of Threshold calculated?

The CVOR system assigns points to safety related convictions as indicated in the Conviction Code Table.

For example:

The same carrier described previously with an adjusted fleet size of 2 vehicles also had the following 4 convictions in the past 24-month period *(note: the 24-month period does not include the most recent 30 days)*:

- Failure to make daily log (6 points);
- Overweight - dual axle over 2000 kg (2 points);
- Failure to display plates while driving motor vehicle - (0 points);
- Failure to inspect/repair/maintain according to standard (6 points).

The Conviction Violation Rate would be calculated in the following manner:

Step 1

Calculate the total conviction points:

6 + 2 + 0 + 6 = 14 (total conviction points).

Step 2

Divide the total conviction points by the number of vehicles operated:

14 ÷ 2 = 7 (total points per vehicle).

Step 3

Divide the number of points per vehicle by the number of months operated:

7 ÷ 24 = 0.2916 (points per vehicle per month).

Step 4

Consult the Table of Threshold Values in *Ontario's Carrier Safety Rating and Commercial Vehicle Operator's Registration System – Public Guideline, 2000* published by the Ontario Ministry of Transportation to determine the conviction threshold for a carrier with an adjusted fleet size of 2. The conviction threshold value for an adjusted fleet size of 2 is 0.7059.

Step 5

Calculate the percentage of threshold by dividing the points per vehicle per month by the conviction threshold value in the table and multiplying the result by 100:

(0.2916 ÷ 0.7059) x 100 = 41.3% (% of conviction threshold = P_c).

In other words, this carrier's conviction violation rate is at 41.3% of the conviction threshold established for a carrier with an adjusted fleet size of 2 vehicles.

How are the Inspection Violation Rate and Percentage of Threshold calculated?

The CVOR system assigns points to Commercial Vehicle Safety Alliance (CVSA) out-of-service (oos) vehicle defects. This calculation is performed on the number of vehicle units inspected as opposed to the adjusted fleet size used to calculate the accident and conviction violation rates.

Two calculations are performed to derive the inspection threshold.

For example:

The same carrier as before with an adjusted fleet size of 2 vehicles had the following 3 inspections in the past 24-month period *(note: the 24-month period does not include the most recent 30 days)*:

Table 1
Out-of-Service Points Calculation Table
(1 point per defect)

	Power Unit	Trailer 1	Converter Dolly	Trailer 2	Total Points Assigned	# Vehicle units inspected
Inspection 1	1	0	0	1	2	4
Inspection 2	0	0	N/A	N/A	0	2
Inspection 3	3 (max. 2 pts.)	4 (max. 2 pts.)	0	2	6	4
				Total	8	10

Calculation 1

Calculate the total inspection points:

- Remember, each oos defect is assigned 1 point, but the maximum number of points assigned for each vehicle unit inspected is 2.
- Remember, a minimum of 2 inspections are required to calculate the Inspection Violation Rate.

2 + 0 + 6 = 8 (total inspection points where 1 oos defect = 1 point).

Calculation 2

Step 1

Determine the total number of inspections in which at least one oos defect was discovered. In this carrier's case, 2 inspections had oos defects (inspections 1 and 3).

Step 2

Determine the total number of inspections conducted in the previous 24-month period *(note: the 24-month period does not include the most recent 30 days).* In this case, the carrier had 3 inspections.

Step 3

Divide the total number of inspections with oos defects by the total number of inspections conducted and multiply by 100:

(2 ÷ 3) x 100 = 66.7% (oos rate).

Step 4

Locate the out-of-service rate standard as indicated on the second page of the Carrier CVOR Abstract (Level II). In this case, the standard is 35.3%.

Step 5

Count 1 point for every full 10% the oos rate in Step 3 exceeds the current out-of-service rate standard (Step 4):

66.7% - 35.3% = 31.4% = 3 points (1 point for each full 10%)

Step 6

Add the points calculated in Calculation 1 to the value calculated in Step 5 and divide by the number of vehicle units inspected as found in Table 1:

8 + 3 = 11 points (from 10 vehicle units inspected)

11 ÷ 10 = 1.1000 points per vehicle unit inspected.

Consult the Table of Threshold Values in *Ontario's Carrier Safety Rating and Commercial Vehicle Operator's Registration System – Public Guideline, 2000* published by the Ontario Ministry of Transportation to determine the inspection threshold for a carrier with 10 vehicle units inspected (1.9775).

Step 7

Calculate the percentage of threshold by dividing the points per vehicle units inspected by the inspection threshold value in the table and multiplying the result by 100:

(1.1000 ÷ 1.9775) x 100 = 55.6% (% of inspection threshold = P_i).

In other words, this carrier's inspection violation rate is at 55.6% of the inspection threshold established for a carrier with 10 vehicle units inspected.

How does the CVOR system calculate a carrier's overall performance?

The carrier's overall performance is determined by combining its accident, conviction and inspection performance values in the proportions of 2 to 1 to 1.

The overall performance measure formula is:

$P_o = (2P_a + P_c + P_i) / 4$

Where: P_o = Overall Performance
P_a = Accident Performance
P_c = Conviction Performance
P_i = Inspection Performance

When a carrier's overall violation rate exceeds 1 (100%), it is said to be "over threshold" and may be subject to sanctioning by the Registrar of Motor Vehicles.

Remember that the Overall Percent of Threshold calculation weights accidents at double the severity of convictions and inspections (2:1:1 ratio).

Step 1

Multiply the Percent of Accident Threshold (105.9%) by 2, then add the Percent of Conviction Threshold (41.3%) and Percent of Inspection Threshold (55.6%):

2(105.9%) + 41.3% + 55.6% = 308.7%.

Step 2

Divide the value in Step 1 by 4:

308.7% ÷ 4 = 77.2% (Percent of Overall Threshold).

This value represents the carrier's overall violation rate as a percentage of its overall threshold.

How is the overall violation rate calculated as a percentage of the overall threshold when a carrier's fleet size has changed?

When a carrier's fleet size has changed within a two-year period, the Ministry assigns a violation rate for each fleet size period and averages the violation rate over the full two-year period. This averaging of fleet size more accurately determines a carrier's overall violation rate as a percentage of overall threshold.